5 MANAGEMENT GOALS

The goals in this chapter provide broad guidance for management and are accompanied by practical tasks intended to achieve the goals. The central focus of this Land Management Plan (LMP) is the use of an ecosystem-based approach to management of the diverse mosaic of managed and natural habitat communities in the Yolo Bypass Wildlife Area (Wildlife Area). The goals are drawn from nine years of adaptive management and the information generated through the planning process, and express the direction that ongoing operation of the Yolo Bypass Wildlife Area will take. It is important to note, however, that implementation of many of the tasks identified in this plan is dependent upon having adequate staff and operations and maintenance budget. Thus, additional Wildlife Area personnel and budget are required to accomplish the tasks identified in this chapter. These personnel needs are described in Chapter 6, "Operations and Maintenance."

The management goals and tasks described in this chapter were evaluated for their potential impact on the environment in accordance with the provisions of the California Environmental Quality Act (CEQA). An Initial Study was prepared in accordance with the State CEQA Guidelines, which is included as Appendix H. This Initial Study concluded that this LMP, as proposed, would not have a potentially significant impact on the environment. Accordingly, a proposed Negative Declaration finding that the project will not have a potentially significant impact on the environment has been prepared.

The CEQA document analyzes impacts resulting from the programmatic implementation of this LMP. The details of specific projects that may be developed consistently with this LMP are not yet known. Any future projects that may involve environmental effects will need to be evaluated in light of the IS/ND to determine if additional project-specific CEQA analysis is necessary. The type of additional CEQA review completed would be determined based on CEQA Guidelines Sections 15162–15164. Permits, consultations and/or approval actions may also be required to approve specific future projects. Examples of potential future permit requirements include the following:

- U.S. Fish and Wildlife Service (USFWS) – federal Endangered Species Act (ESA) consultation and issuance of take authorization;
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) – federal Endangered Species Act consultation and issuance of take authorization;
- U.S. Army Corps of Engineers (USACE) – Section 404 Clean Water Act (CWA) permit for discharge or fill of waters of the U.S., Section 10 Rivers and Harbors Act permit for work in navigable waters of the U.S., approval of modification of USACE levees;
- California Department of Fish and Game (DFG) – internal consultation regarding California Endangered Species Act (CESA) compliance and streambed alteration agreement (Section 1602 of DFG Code);
- California Department of Water Resources (State Reclamation Board) – encroachment permit to work on or adjacent to levee and in designated floodways, approval/authorization of new or restored levees;
- California State Lands Commission – consultation/permit regarding possible secondary impacts to surrounding lands underlying rivers and streams; and

- Regional Water Quality Control Board – National Pollutant Discharge Elimination System construction stormwater permit (Notice of Intent to proceed under the statewide General Construction Permit), potential discharge permit for wastewater, general order for dewatering, CWA Section 401 clean water certification if Clean Water Act (CWA) Section 404 permit is required or if isolated wetlands subject to the Porter-Cologne Act will be affected.

Prior to ground disturbance in areas that have experienced development or disturbance and could contain hazardous materials, a hazardous materials assessment will be conducted. If hazardous materials are detected, the appropriate agencies or companies will be consulted to ensure that people and the environment are not exposed to hazardous materials.

Habitats are managed in accordance with the operations and maintenance manual for the project modifications (as updated in supplement, U.S. Army Corps of Engineers 2003) to the Sacramento River Flood Control Project, and pursuant to the MOU between DFG, State Reclamation Board, USFWS, and DWR regarding threatened and endangered species.

5.1 DEFINITION OF MANAGEMENT TERMS

This LMP has been developed in accordance with the California Department of Fish and Game's (DFG's) *Guide and Annotated Outline for Writing Land Management Plans*, February 2003 (updated 2006) (California Department of Fish and Game 2003, 2006). The Guide organizes management information and guidelines into elements, goals, and tasks, establishing a hierarchy of management direction for the Yolo Bypass Wildlife Area. Elements relate to the broad categories of consideration, goals define objectives within the elements and tasks establish specific actions to attain the goals. Goals are based on the Fish and Game Code, policies of the California Fish and Game Commission, and the goals and objectives of the CALFED ERP (for which DFG is an implementing agency). In addition, it is the policy of the California Fish and Game Commission to protect and preserve all native species diversity including those species experiencing a significant decline that, if not halted, would lead to their designation as threatened or endangered. Similarly, the goals of the CALFED ERP include achieving the recovery of at-risk native species that depend on the Delta and reversing downward population trends of native species that are not listed. Together these elements, goals, and tasks express the policy direction that will guide the management of the Yolo Bypass Wildlife Area.

A terminology for describing management is part of DFG's standardized format for management plans. The terms defined below are used throughout this LMP to describe the current and planned management of the Yolo Bypass Wildlife Area.

ELEMENTS

- An **element** is any biological unit, public-use activity, facility maintenance program, or management coordination program (as defined below) for which goals have been prepared and presented within this LMP.
- The **biological element** refers to ecosystems for which specific management goals have been developed within this LMP.
- The **agricultural resources element** refers to agricultural activities.
- The **public-use element** refers to recreational and other public uses.
- The **cultural resources element** refers to preservation of cultural resources.
- The **facility maintenance element** refers to the program of maintenance and administrative tasks that supports the attainment of goals for the biological and public-use elements.

- The **scientific research and monitoring element** refers to scientific research and monitoring that supports the attainment of goals for the biological and public-use elements.

- The **fire management element** refers to the planning and implementation of fire management that supports the attainment of the goals for the biological and public use elements.

- The **management coordination element** refers to coordination with management programs that are supportive of and compatible with the activities of other public agencies.

GOALS

- A **biological goal** is a statement describing management and its intended long-term results for a biological element.

- An **agricultural resources goal** is a statement describing management and the resulting type and level of agricultural activities for the agricultural element.

- A **public-use goal** is a statement describing management and the resulting type and level of public use (which is intended to be compatible with the goals for biological elements).

- A **cultural goal** is a statement describing management and its intended results for a cultural resources element.

- A **facility maintenance goal** is a statement describing management and the resulting type and level of facility maintenance (which is intended to support attainment of the goals for the biological and public-use elements).

- A **scientific research and monitoring goal** is a statement describing management of procedures for or types of scientific research and monitoring conducted at Yolo Bypass Wildlife Area.

- A **fire management goal** is a statement describing a desired component of fire management planning and coordination of activities occurring before, during, or after fires.

- A **management coordination goal** is a statement describing the desired type and level of management coordination activities that are required to achieve the biological element and public use goals previously specified within this LMP.

TASKS AND ADAPTIVE MANAGEMENT

- **Tasks** are individual projects or work elements that implement the goals and are useful in planning operation and maintenance budgets.

- **Adaptive management** is a dynamic strategy in which management efforts are monitored regularly to assess their status and effectiveness. Monitoring results are then evaluated and used to update management goals and implementation strategies (i.e., tasks). An adaptive management strategy has been applied to all elements within this LMP.

5.2 GOALS AND TASKS FOR ELEMENTS

Elements, goals and tasks are described here in detail. The accompanying chart of assigned staff hours necessary to complete these tasks are described in chapter 5. This chart summarizes many of these tasks and is therefore not an identical task list.

5.2.1 BIOLOGICAL ELEMENTS

White-faced Ibis at sunrise

The biological elements of the Yolo Bypass Wildlife Area include management for species guilds and natural communities. The species guilds have been grouped into nine sub-elements: waterfowl, shorebirds and wading birds, upland game species, raptors, cavity-nesting birds, neotropical birds, other waterbird species, special-status species, and nonnative species not beneficial to wildlife.

A more general discussion of the natural communities of the Yolo Bypass Wildlife Area have been grouped into five sub-elements: seasonal and permanent wetlands, agriculture, riparian, grasslands, upland, and aquatic ecosystems. Each of these sub-elements has its own set of goals and tasks. These sets of goals and tasks are not focused on particular species of plants and animals, but instead are more broadly focused on achieving ecosystem level benefits. More specifically, these are intended to create, maintain and enhance wetlands, agricultural lands, riparian areas, grasslands and uplands, and aquatic ecosystems to sustain habitats for native plants and animals and provide other desired ecosystem services. At all times these habitats are to allow for necessary conveyance of flood flows. Chapter 3, "Environmental Setting," contains additional information regarding biological resources within the Yolo Bypass Wildlife Area.

At the Yolo Bypass Wildlife Area, there are opportunities to manage for species guilds and maintain, enhance, and/or restore all of these natural communities, including those that provide habitat for special-status and game species. These opportunities include:

- maintenance, enhancement, and/or restoration of communities for use by:
  - large numbers of wintering waterfowl by propagating adequate food supplies and presenting them appropriately at the appropriate time;
  - breeding waterfowl by providing nesting cover and appropriately spaced brood water;
  - shorebirds and wading birds, including both migratory and resident species, by propagating adequate invertebrate food supply, and providing appropriate water depths for foraging activities throughout the year;
  - breeding shorebirds and wading birds including avocets, stilts, phalaropes, killdeer, rails, ibis, black crowned night herons, moorhens, great blue herons, and snowy and great white egrets by providing appropriate nesting habitat;
  - a variety of other resident and migratory species including raptors, grebes, loons, rails, and songbirds;
  - ground nesting birds such as meadowlark, short-eared owls, harriers, and terns by providing adequate cover and prey base;
  - cavity-nesting birds, such as kestrels, tree swallows, and wood ducks by providing large trees for nesting or nest boxes;
  - neotropical migratory birds by providing riparian habitat when appropriate;

- management of seasonal and permanent wetlands, and agricultural lands to minimize mercury methylation as prescribed by the most current research - monitoring of mercury levels within wetland units will judge effectiveness and direct adaptive management;

- management of seasonal and permanent wetlands and agricultural lands to minimize mosquito populations and outbreaks of disease through implementation of agreed upon "best management practices" as described in Kwasny et.al. (2004);

- management of agricultural lands to generate critical income for the operation of the Wildlife Area while utilizing agriculture as a wildlife management tool, providing important wildlife habitat values;

- maintenance, enhancement, and/or restoration of seasonal and permanent wetland, vernal pool and grassland, and riparian communities;

    - management activities to support all vernal pool species including special-status plant species including Ferris' milk-vetch, alkali milk vetch, Baker's navarretia, Heckard's pepper-grass, and potentially suitable habitat for nearly two dozen other special-status plants. Management activities will follow accepted scientific principles and may include selective use of herbicides, appropriate grazing practices, and the ecological use of fire. Translocation of plants or their introduction to the Wildlife Area will follow scientific precepts and hypothesis testing;

    - management activities to support the distribution, among all Yolo Bypass Wildlife Area habitats, 46 special-status and priority wildlife and fish species identified in the CALFED Bay-Delta Program (CALFED) *Multi-Species Conservation Strategy (MSCS)*, and the presence of potentially suitable habitat for eight additional special-status wildlife and fish species (among the special-status wildlife occurring in the Yolo Bypass Wildlife Area are five vernal pool crustaceans, giant garter snake, northwestern pond turtle, Swainson's hawk, burrowing owl, loggerhead shrike, tricolored blackbird, American white pelican, Chinook salmon, steelhead, and Sacramento splittail);

- management activities to support the presence of a breeding colony of more than 100,000 Mexican free-tailed bats and other bat species;

- restoration and enhancement of freshwater tidal marsh adjacent to the East Toe Drain below Lisbon Weir;

- restoration and enhancement of Putah Creek and associated aquatic habitats and ecological processes in the seasonal floodplain by creating a south flowing channel alignment from the creek through the sinks of the Tule Ranch and entering the East Toe Drain in a tidal area south of Lisbon Weir; and

- enhancement of habitats through removal and management of nonnative invasive species that do not benefit wildlife species or that impact special status plants.

There are also a number of important constraints on the management of the Yolo Bypass Wildlife Area's biological element. These constraints include:

- Seasonal flooding resulting from the operation of regional flood control systems and overflow from local creeks and sloughs;

- availability of staff and funding;

- the need to ensure compatibility of biological resource management activities and floodwater conveyance including management of emergent vegetation;

- the need to ensure compatibility of biological resource management activities and public uses;

- human disturbance to wildlife habitat or agricultural operations;
- vector management (i.e., mosquito control) requirements;
- adverse effects of spring flooding on management and operations, wildlife nesting, and farming;
- potentially inadequate water quantity available for summer irrigation;
- methylation of mercury in wetlands and agricultural lands; and
- potential management conflicts between agricultural practices and wildlife management activities and the ecological requirements of special status plant and animal species.

Chapter 3, "Environmental Setting," contains additional information regarding biological resources within the Yolo Bypass Wildlife Area.

5.2.1.1 MANAGEMENT FOR SPECIES GUILDS

The Yolo Bypass Wildlife Area is one of the primary wintering, breeding, and migratory stopover areas along the Pacific Flyway. The Wildlife Area supports vast numbers of birds on a year-round and seasonal basis. The broad diversity of species guilds supported by the Yolo Bypass Wildlife Area is tied, in part, to the diversity of communities that provide habitat within the Wildlife Area. These managed communities, which include seasonal and permanent wetlands, agricultural fields, riparian woodlands, and grasslands provide a diverse matrix of nesting and foraging habitats for several guilds and support a rich assemblage of terrestrial and aquatic invertebrates as well as cultivated crops and natural vegetation that form the forage base for shorebirds and wading birds, waterfowl, upland game species, raptors, cavity-nesting birds, neotropical migratory birds, and a variety of other waterbirds.

In recognition of the vital habitat values provided by the Yolo Bypass Wildlife Area, the National Audubon Society has named it a Globally Important Bird Area. As California's Great Central Valley continues to grow and natural areas are converted to housing and commercial developments, the importance of large, contiguous areas with a diverse variety of habitats such as the Yolo Bypass Wildlife Area will increase. To preserve these values, the YBWA is managed using an ecosystem approach to benefit the full suite of wildlife guilds utilizing the wildlife area as opposed to a management approach focused on a single species or single group of species.

The Species Guilds sub-element includes goals for management of multiple communities to provide habitat and benefit several guilds of bird species. An additional goal is also provided for the Mexican free-tailed bat colony present under the Yolo Causeway. These goals are based on the stated purpose of land acquisition by the Wildlife Conservation Board (WCB) (Wildlife Conservation Board 2001); on the CVHJV's habitat restoration goals under the North American Waterfowl Management Plan (NAWMP); and on the California Fish and Game Code, the policies of the California Fish and Game Commission, and the goals and objectives of the CALFED Ecosystem Restoration Program (ERP) (for which DFG is an implementing agency).

These tasks are based on nine years of experience in adaptively managing these communities on the original 3,700-acre Yolo Bypass Wildlife Area and five years of managing the newly acquired Glide and Los Rios properties. Actions proposed must comply with the federal and California Endangered Species Acts (ESA and CESA) and other regulations aimed at the protection of special-status species and sensitive habitats, including the current Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS), California Department of Water Resources (DWR), and the State Reclamation Board regarding the management of special-status species at the Yolo Bypass Wildlife Area.

Wetland management techniques are built upon the prescriptions as described in *"A Guide to Wetland Habitat Management in the Central Valley"* (California Department of Fish and Game 1995) and have been adapted to

specific environmental conditions within the Yolo Bypass and the need to remain compatible with the flood control function of the Yolo Bypass.

Northern Pintail

Species Guilds Goal 1 (SG-1): *Manage and maintain habitat communities for waterfowl species.*

A significant feature of the Yolo Bypass Wildlife Area is the abundance and variety of wintering waterfowl that migrate down the Pacific Flyway each year. Waterfowl populations are a highly valued and diversified biological resource. Large numbers of ducks, geese, and swans winter in the Wildlife Area after migrating from northern breeding areas. Abundant species include northern pintails, northern shovelers, mallards, gadwalls, American wigeons, cinnamon and green-winged teals, scaups, ring-necked ducks, snow gees, tundra swans, and white-fronted geese. Some species, such as mallards, cinnamon teal, gadwalls, and Canada geese, are also yearlong residents and breed locally in wetlands and nearby uplands. Waterfowl are a significant component of the Wildlife Area, and are of high interest to recreational hunters and bird watchers.

A peak in the number of waterfowl in the Wildlife Area occurs in December–April, when large numbers of species in this guild are present and seasonal wetlands are flooded. A secondary peak in summer correlates with the presence of breeding ducks that nest throughout the Wildlife Area, primarily mallard and cinnamon teal. During periods of water inundation in the Bypass, diving species such as canvasback, scaup, and goldeneye can be present in significant numbers.

The propagation of beneficial plants and subsequent fall flooding of seasonal wetlands is the primary wetland management strategy in the Yolo Bypass Wildlife Area for migratory waterfowl. The post harvest flooding of agricultural crops, primarily rice, has effectively attracted thousands of wintering waterfowl to the Yolo Bypass Wildlife Area. Grazing, upland cover plantings, and the maintenance of properly spaced brood ponds are some strategies used for nesting waterfowl. In addition, agricultural activities provide high quality habitat for species in this bird guild.

The tasks listed below identify specific management activities intended to benefit resident and migratory waterfowl species.

Tasks:

1. Manage seasonal and permanent wetlands and other communities to provide habitat for resident waterfowl species.

    a. Draw down flooded seasonal wetlands in the spring (April 1) to promote growth of swamp timothy as a forage crop.

        i. include summer irrigation (as necessary) throughout 33% of the seasonal wetlands in order to increase seed yield, stimulate germination and propagation of water grass and provide foraging opportunities for Swainson's hawk.

    b. Disc, mow, burn, and/or graze vegetation as necessary to promote desirable species, eliminate species not valuable for wildlife (e.g., cocklebur), promote a higher quality seed bed for the following year and to maintain required ratios of open water and emergent vegetation after fall flood up.

    c. Maintain shallowly flooded shorebird management areas in August to attract early arriving waterfowl.

d. Flood seasonal wetlands beginning September 1 in anticipation of the arrival of migratory waterfowl.

e. Flood rice fields as early as possible after harvest is completed to attract migratory waterfowl.

f. Disc islands in seasonal wetlands prior to flood up in order to provide loafing areas for waterfowl and shorebirds.

g. Construct linear islands with disc ridger prior to flood up in order to increase loafing areas for waterfowl and shorebirds.

h. Maintain permanent ponds and other brood water at no more than one mile intervals to promote increased waterfowl chick survival in the Yolo Bypass Wildlife Area.

   i. Space managed brood waters at no more than one mile intervals.

   ii. Perform periodic irrigation in upland swales to increase brood water and promoted production of important prey species for waterfowl chicks.

2. Manage upland vegetation to provide desired nesting habitat.

   a. Plant fields of wheat combined with vetch to provide high quality nesting habitat the following year.

   b. Control invasive weeds such as perennial pepperweed and starthistle.

   c. Perform scattered irrigations in upland areas to increase humidity and subsequent invertebrate numbers for the benefit of ground nesting birds such as mallard and ring-necked pheasant. These irrigations must be conducted quickly and drained thoroughly to prevent production of large numbers of mosquitoes.

   d. Continue to enhance upland areas with the construction of topographic features such as swales to create microhabitats and more effectively move water on and off the field.

3. Maintain a sanctuary area where public access is prohibited in order to provide safe haven for migratory waterfowl.

   a. Flood sanctuary area within the month of September.
   b. Maintain permanent sanctuaries without changing locations.
   c. Do not consider non-hunting areas open for other public uses as sanctuary.

4. Monitor waterfowl populations periodically to assess management techniques and species response; apply adaptive management techniques as appropriate.

   a. Conduct monthly surveys of waterfowl numbers, twice monthly during the months of September through March.

   b. Acquire survey data collected by USFWS during annual mid-winter surveys.

   c. Conduct annual surveys of representative upland areas for nesting waterfowl.

American avocet, a common breeding species at the Yolo Bypass Wildlife Area

Species Guilds Goal 2 (SG-2): *Manage and maintain habitat communities for shorebird and wading bird species.*

The Yolo Bypass Wildlife Area has become one of the premier shorebird areas in the Central Valley. With managed seasonal wetlands providing shallow water, mud flats, and island mounds, and the development and implementation of a fallow shorebird management phase introduced to the rice rotation, hundreds of thousands of shorebirds and wading birds annually migrate through the Wildlife Area, spend the winter, and perhaps breed in the Yolo Bypass Wildlife Area. Some shorebird and wading bird species are year-round residents. Representative species of breeding shorebirds and wading birds include American avocets, black-necked stilts, spotted sandpipers, Wilson's phalarope (rarely), killdeer, pied-billed grebe, sora and Virginia rail, white-faced ibis, great blue heron, common moorhen, great and snowy egret, and black-crowned night heron. All of these species are a significant component of the Wildlife Area avifauna and are of high interest to recreational bird watchers.

Common wintering species include greater yellowlegs, dowitcher, least sandpiper, and black-bellied and semipalmated plover. During the late winter, these species are joined by dunlin, western sandpiper, and marbled godwit.

Habitat characteristics valuable for shorebirds when presented at the proper seasonal period and timing include:

- shallow open water with varied topography or a sloped pond bottom;
- a forage base of invertebrate populations, and dense concentrations of invertebrate prey necessary to feed shorebirds; and
- bare islands for roosting and nesting.

The tasks listed below identify specific seasonal management activities intended to benefit shorebird species. These techniques have been tested and adapted as needed on the 3,700-acre Yolo Bypass Wildlife Area over the last nine years.

Tasks:

1. Manage seasonal wetlands for shorebird species.

    a. *Spring:* Draw down flooded seasonal wetlands in spring (April 1) to promote growth of swamp timothy while providing important mudflat habitat for migratory and resident shorebirds. Provide bare islands for nesting which become raised mounds upon draw down. Water maintained in low lying swales will provide foraging areas for breeding shorebirds.

    b. *Summer:* Provide mudflat habitat in July and August during the peak of shorebird migration.

        1. Drain permanent wetlands in midsummer.

            a. Permanent wetlands are periodically drained in midsummer on a 4–6 year cycle in order to perform important vegetation control activities. When drained, open areas will contain concentrated numbers of fish and invertebrates, which will be available for consumption for a

large variety of water birds. Timing these draw downs with the arrival of migratory shorebirds in July will provide excellent shorebird foraging habitat.

2. Flood newly disced areas in July.

a. Areas can be opened up through burning, mowing, grazing, followed by discing and flooded for shorebird use.

3. Hold winter water until late drawdown in June.

a. While still experimental at this time, a June drawdown provides the required density of prey species but will also result in an increased amount of emergent vegetation and undesirable plant species such as cocklebur (*Xanthium* strumarium) and joint grass (*Paspalum distichum*). These areas also provide good brood water for waterfowl.

c. *Winter:* Flood and maintain shallow water for shorebird foraging. Maintain bare islands for loafing.

2. Manage agriculture for shorebird species through newly developed shorebird/rice rotation.

a. *June:* Prepare fallow rice field for planting, including rough discing, finish discing, land planning (if necessary), construction of contour ridges, and installation of water control structures.

b. *July 1:* Flood shallow unplanted rice fields which have been disced at least twice.

c. *July 1 through end of August:* Maintain shallow water.

d. *September 1:* Drain fields, disc weeds and prepare field for rice planting to occur in the following spring.

Black-necked stilts in fallow rice field managed for shorebirds

3. Monitor shorebird populations periodically to assess management techniques and species response; apply adaptive management techniques as appropriate.

4. Perform field preparation of some agricultural fields in the fall in order to present disced field habitat for species that utilize this habitat such as horned larks, longspurs, and mountain plover.

5. Provide staggered timing of rice shore bird rotation so that there are always some fields in the shorebird rotation.

Species Guilds Goal 3 (SG-3): *Maintain and enhance habitat for upland game species.*

Primary upland game bird species include mourning doves and ring-neck pheasants. Ring-necked pheasant numbers fluctuate in the Yolo Bypass based on the severity of flooding. Successive years without serious flooding result in spectacular numbers of pheasants. Tenant farmers grow fields of safflower that greatly benefit mourning dove with abundant foraging opportunities. Safflower is also left unharvested and mowed to provide additional foraging prospects for these species. These management strategies have resulted in improved upland game bird hunting throughout the Wildlife Area.

Ring-necked pheasant

Turkeys are a recent addition to the avifauna of the Yolo Bypass Wildlife Area. Found primarily moving up and down Putah Creek and adjacent agricultural fields, turkey may soon become a prominent fixture at the Wildlife Area and perhaps could be considered for inclusion in an upland game hunting program.

California quail are occasionally seen along Putah Creek and the Toe Drain. They are not expected to become common enough to include in an upland game hunting program.

The tasks listed below identify specific management activities intended to benefit upland game species.

Tasks:

1. On an experimental basis, dedicate two fields to provide all habitat requirements within discreet areas in accordance with Diverse Upland Habitat Unit (DUHU) techniques being developed on several state wildlife areas.

2. Annually plant nesting cover including legumes that will improve nesting habitat for upland game species.

3. Consider providing nesting structures for mourning dove.

4. Annually plant grain field to provide foraging areas for upland game and hunting opportunities for upland game hunters.

5. Control invasive weeds such as perennial pepperweed and starthistle.

6. Perform scattered irrigations in upland areas to increase humidity and subsequent invertebrate numbers for the benefit of ground nesting birds such as mallard and ring-necked pheasant. These irrigations must be conducted quickly and drained thoroughly to prevent production of large numbers of mosquitoes.

7. Continue to enhance upland areas with the construction of topographic features such as swales to create micro habitats and more effectively move water on and off the field.

Soaring Swainson's hawks

Species Guilds Goal 4 (SG-4): *Manage and maintain habitat communities for raptors.*

The Yolo Bypass Wildlife Area is a very important location for wintering birds of prey including white-tailed kites, rough-legged hawks, prairie falcons, merlins, peregrine falcons, kestrels, ferruginous hawks, barn owls, great horned owls, short-eared owls, northern harriers, and large numbers of red-tailed hawks. Breeding raptor species in the Wildlife Area include Swainson's hawks, red-tailed hawks, kestrels, northern harriers, white-tailed kites, barn owls, burrowing owls and great horned owls. Swainson's Hawks are especially abundant through much of Yolo County and the Wildlife Area lies in middle of an abundant local population. Over a dozen nests have been found on or adjacent to the Wildlife Area. Discing, mowing, and

summer irrigations attract large numbers of Swainson's hawks feeding on grasshoppers. Fall preparation of agricultural fields also attracts wintering raptors.

Discing often attracts several Swainson's hawks

Management strategies for raptors include optimizing foraging opportunities by managing for a food base consisting of rodents and large insects. Although rodent numbers are highly dependent on the timing, magnitude, and duration of flooding in the Yolo Bypass, they seem to quickly reinvade the floodplain. The propagation of grain fields increases local numbers of rodents, providing an increased prey base. Encouraging the proliferation of sweet clover and maintaining high humidity in pond/wetland bottoms helps to develop high grasshopper numbers, an important food item for Swainson's Hawks. Recent development of shorebird management areas has locally increased numbers of shorebird predators, including peregrine falcon and merlin.

The tasks listed below identify specific management activities intended to benefit these bird species.

Tasks:

1. Manage for rodents and large insects to provide adequate prey items in order to benefit foraging raptor species.

    a. Maintain moist pond-bottom conditions to promote the development of high grasshopper populations.

    b. Manage discing, mowing, and summer irrigation to attract large numbers of Swainson's hawks, which feed on grasshoppers.

    c. Manage fall flooding of agricultural fields to attract wintering raptors.

    d. Plant food plots that will not only provide food for birds, but rodents as well. Legumes and grain crops such as vetch, clovers, wheat, sunflower, milo, corn, and safflower are recommended.

    e. Consider the adverse effects of intentional spring flooding on rodent numbers and subsequent raptor use.

2. Monitor populations of raptors to assess management techniques and species response; apply adaptive management techniques as appropriate.

    a. Identify correlative factors such as Bypass flood dates, annual rainfall totals, or rodent numbers.

    b. Conduct bi weekly raptor surveys throughout the year.

Species Guilds Goal 5 (SG-5): *Manage and maintain habitat communities for cavity-nesting bird species.*

Cavity-nesting birds, such as kestrels, tree swallows, and wood ducks can be seen throughout the Wildlife Area. Providing nesting boxes for these cavity-nesters benefits these species in the Wildlife Area. Swallows are summer migrants, occurring in the Wildlife Area from late winter to early fall (February–October), with peak abundance generally in June and July. Large post-breeding flocks of swallows can occur in the late summer, particularly when flying insect populations associated with wetlands and agricultural fields are abundant.

The tasks listed below identify specific management activities intended to benefit cavity-nesting bird species.

Tasks:

1. Utilizing interested volunteers, provide and maintain nesting boxes for cavity nesters such as American kestrels, tree swallows, barn owls, and wood ducks in appropriate habitats.

2. Restore and enhance riparian vegetation for cavity nesters where compatible with flood management.

3. Monitor populations of cavity-nesting bird species periodically to assess management techniques and species response; apply adaptive management techniques as appropriate.

Species Guilds Goal 6 (SG-6): *Manage and maintain communities for neotropical bird species.*

Many species of neotropical migratory birds migrate through or breed in the Yolo Bypass Wildlife Area. The neotropical migratory bird guild comprises bird species that breed in North America and winter in Central and South America. Representative species of the neotropical migratory bird guild are western kingbirds, western wood-pewees, swallows, orioles, warblers, blue grosbeaks and yellow-breasted chats.

Regionally, there have been substantial losses of historic habitat used by neotropical migratory species, and available information suggests that population levels for many of these species are declining. Continued management of existing and restoration of additional suitable wetland, riparian, and grassland habitats in the Yolo Bypass Wildlife Area is important to maintaining healthy neotropical migrant bird populations. Protection and restoration of nesting habitat helps reduce nest parasitism and predation by creating habitat conditions that render neotropical birds less susceptible to these stressors.

Upland habitat management that includes providing community variations in height, density of vegetation, food crops, and water has proven to be beneficial to many neotropical migratory song birds. Opportunities to increase length and density of riparian vegetation along Putah Creek and the East Toe Drain will also benefit species in this guild. Riparian areas act as corridors for migratory songbirds.

The tasks listed below identify specific management activities intended to benefit neotropical migratory bird species.

Tasks:

1. Maintain and enhance riparian vegetation along Putah Creek and the East Toe Drain to serve as corridors for resident and migratory songbirds and nest sites for a variety of species. Due to the increased roughness created by riparian vegetation in the floodway, any increase in acreage of riparian vegetation would require hydraulic modeling to guide design and confirm achievement of performance criteria, and approval from the State Reclamation Board.

2. It has been shown that rows of trees growing parallel to the two external levees of the Bypass can protect these levees from erosion due to wave action. Approval and establishment of appropriate tree lines should be pursued.

3. Manage upland habitat to include variations in height, density of vegetation, food crops, and water to benefit a diverse array of resident ground nesting shorebirds, songbirds, raptors and owls as well as game species such as ring-necked pheasant.

4. Monitor populations of neotropical bird species periodically to assess management techniques and species response; apply adaptive management techniques as appropriate.

Species Guilds Goal 7 (SG-7): *Manage and maintain communities for a variety of other waterbird species including grebes, rails, bitterns, ibis and songbirds associated with emergent marsh vegetation.*

Common moorhen feeding chicks

Emergent marsh vegetation communities provide valuable habitat for a number of water bird species. The tasks listed below identify specific management activities intended to benefit these bird species.

Tasks:

1. Maintain appropriate and consistent water levels to maintain high quality habitat for floating nest builders such as pied-billed grebe.

2. Maintain varying amounts of thatch within emergent marsh vegetation in order to attract such nesting species as white-faced ibis, black-crowned night herons, tri-colored blackbirds, and yellow headed blackbirds.

3. Time spring drawdown in some ponds so young grebes, moorhens, coots, and ibis are not stranded.

Mexican free-tailed bats leaving their roost under the Yolo Causeway

Species Guilds Goal 8 (SG-8): *Maintain and enhance foraging opportunities for the presence of breeding colonies of bats roosting under the Yolo Causeway.*

An important feature of the Wildlife Area is its breeding colony of over 100,000 Mexican free-tailed bats. These bats nest each summer under the Yolo Causeway and prey on insects throughout Yolo and Sacramento counties. The location of this colony in a protected Wildlife Area will help to ensure its long-term success. The tasks listed below identify specific management activities intended to benefit the Mexican free-tailed bat colony.

Tasks:

1. Establish baseline data on roosting bat species and population density under the Yolo Causeway.
   a. Conduct acoustic surveys of roosting bats for species identification.
   b. Conduct area measurements of active roosting habitat to establish population density information.
   c. Determine location of foraging areas for Causeway population of bats.
   d. Submit survey results to the CNDDB.

2. Support bat diversity.

   a. After determining which species of bats are roosting under the Yolo Causeway (in addition to the Mexican free-tailed bat, the little brown bat, and the big brown bat), evaluate existing management practices (and constraints) within areas of foraging habitat provided by the Wildlife Area to evaluate if alternative management practices would be suitable for encouraging bat species diversity. Target new adaptive management practices to bat species, which may currently be using the area in small numbers.

b. If pallid bats, a species which feeds almost entirely from the ground, are determined to be roosting under the Yolo Causeway, evaluate if foraging habitat could be managed (within other management constraints) to encourage populations of its most common prey including crickets, beetles, and grasshoppers.

c. If Townsend's big-eared bats, a species particularly susceptible to human disturbance, are determined to be roosting under the Yolo Causeway, reduce human disturbances in this area.

d. Control public access to bat colonies as needed to protect roosting and nesting bats.

e. Protect and enhance scattered riparian vegetation near bat colony.

3. Protect existing bat maternity roost sites under the I-80 Causeway against unauthorized public disturbance by maintaining existing conditions that make it difficult for the public to gain access to these roosting areas.

4. Coordinate with California Department of Transportation (Caltrans) to ensure that their inspections, bridge maintenance activities, and bat colony management actions are consistent with Yolo Bypass Wildlife Area management goals and tasks regarding the maternity roosts under the I-80 Causeway, and to ensure that bat colony management policies are consistent between the two agencies.

5. Encourage preservation of bat colonies as a beneficial natural resource by maintaining and enhancing existing education and outreach programs.

   a. Expand presentation facilities and/or increase the frequency of bat-related educational presentations to accommodate existing levels and anticipated increased levels of public interest in this natural resource.

   b. Encourage bat protection by members of the public who visit the wildlife area by emphasizing their benefits to the ecosystem and the human population, by emphasizing the compromised status of many bat species populations, and by emphasizing regulatory protections that apply to bat species (e.g., Fish and Game Code Sections 1002 and 4150; and Title 14 California Code of Regulations Chapter 3 and Chapter 1 Section 251.1).

6. Monitor bat population species and density periodically to track population trends and assess management techniques and species response; apply adaptive management techniques as appropriate.

5.2.1.2 SPECIAL-STATUS SPECIES

The Special-Status Species sub-element includes goals for management of special-status species that may occur on the Yolo Bypass Wildlife Area. These goals are based on the California Fish and Game Code, the policies of the California Fish and Game Commission, and the goals and objectives of the CALFED Ecosystem Restoration Program (ERP) (for which DFG is an implementing agency).

Giant Garter Snake

DFG currently manages the Yolo Bypass Wildlife Area under a multi-agency MOU with the USFWS, DWR, and the State Reclamation Board. The MOU specifically states that "DFG will take into consideration the specific habitat requirements of the giant garter snake and Swainson's hawk, but the area will not be specifically managed for any other listed or candidate species. Consideration of the habitat needs of the giant garter snake and Swainson's hawk will not impair management in accordance with the operations and maintenance manual for the project

modifications (as updated in supplement, U.S. Army Corps of Engineers 2003) to the Sacramento River Flood Control Project." As such, the following goal is not intended to direct species management. Rather, it is intended to promote management of the communities in a manner that increases general habitat quality, which may benefit many species, including special-status wildlife, fish, and plant species. This goal is specifically intended to not conflict with the existing multi-agency MOU for the Yolo Bypass Wildlife Area.

Special Species Goal 1 (SS-1): *Without specifically managing for special-status species, the communities at the Yolo Bypass Wildlife Area should be managed in a way that generally improves overall habitat quality for species abundance and diversity while not discouraging the establishment of special-status species.*

Several special-status animals are currently known or have the potential to use the ecosystems at the Yolo Bypass Wildlife Area. Comprehensive surveys for all these species have not been conducted; thus their distribution at Yolo Bypass Wildlife Area could be more extensive than documented in the California Natural Diversity Database (CNDDB). Therefore, the results of surveys for these species would determine the need for and scope of the other tasks listed below.

Tasks:

1. Conduct surveys of wildlife, fish, and vegetation communities. The highest priority is to survey for special-status animals and plants that could be present in the ecosystems at the Yolo Bypass Wildlife Area but that are not yet known to occur, such as California tiger salamander, western spadefoot toad, Colusa grass, Crampton's tuctoria, and Bogg's Lake hedge-hyssop. It is also important to survey for other special-status species known to occur in the ecosystems at the Yolo Bypass Wildlife Area but for which much information is lacking, such as giant garter snake and vernal pool crustaceans. Submit observation records to the CNDDB.

2. Monitor populations of special-status species periodically to assess overall habitat integrity, detect changes in distribution and abundance, and detect positive and adverse effects of management activities, human use, and/or nonnative species. Conduct surveys prior to management activities as appropriate to avoid effects.

3. Monitor special-status species use of the floodway in the face of rising and receding floodwaters.

4. Expand the purview of the MOU to address all special-status species currently known to occur in the Yolo Bypass Wildlife Area and include the entire acreage of the expanded Wildlife Area.

5. Upon certification of the operations and maintenance manual for the project modifications (as updated in the supplement, U.S. Army Corps of Engineers 2003) to the Sacramento River Flood Control Project, fulfill reporting requirement described within.

5.2.1.3 NONNATIVE INVASIVE SPECIES

The Nonnative Invasive Species sub-element includes goals for management of nonnative invasive species not beneficial to wildlife or that could impact special status plants. These goals are based on the California Fish and Game Code, the policies of the California Fish and Game Commission, and the goals and objectives of the CALFED Ecosystem Restoration Program (ERP) (for which DFG is an implementing agency).

The Yolo Bypass Wildlife Area contains several invasive weeds that are in need of control efforts. Yellow star thistle tends to occur in disturbed upland areas including parking lots and roads. It appears to thrive during non-flood years. Perennial pepperweed is pervasive in the higher portions of the wetland areas and throughout the uplands. Cattle grazing has effectively kept perennial pepperweed controlled on the Tule Ranch, allowing native forbs to thrive. Most ditches in the Yolo Bypass are eventually choked with water primrose. Many of these ditches are shared with lessees, who contribute towards the control of this invasive aquatic weed. Control measures may include mechanical removal with an excavator or chemical control through the use of aquatic herbicides. Many management activities are coordinated within the Yolo Weed Management Area.

Invasive Species Goal 1 (IS-1): *Prevent the introduction and spread of invasive nonnative species that have no benefit to wildlife or that impact special status plants.*

This goal is based on the need to avoid the potential consequences of the introduction and spread of invasive species, and on a related goal of the CALFED ERP (for which DFG is an implementing agency). The establishment of additional invasive nonnative species could cause substantial adverse modifications to ecosystems. Thus, a goal of the CALFED ERP is to prevent the establishment of additional nonnative invasive species. The tasks listed below represent a strategic approach toward attaining this goal.

Tasks:

1. Inventory habitats within the Yolo Bypass Wildlife Area for infestations of invasive plants. Monitor these infestations and identify correlative factors such as flooding or vegetation manipulation.

    a. Monitor occurrences of star thistle throughout all upland habitats.

    b. Monitor occurrences of perennial pepperweed in grassland and wetland communities.

    c. Monitor abundance and distribution of water primrose in the wetlands and irrigation infrastructure on the Yolo Bypass Wildlife Area.

2. Prioritize infestations for treatment based on the risks that individual infestations pose to ecosystem services, public infrastructure, and other resources within the Yolo Bypass Wildlife Area, and based on the likelihood that the infestation can be treated and maintained in a cost-effective manner.

    a. Monitor hot spots of introduction (e.g., sites along roads, trails, ditches, and canals, near parking areas, and in turnoffs) to enable early detection and rapid eradication of invasives.

    b. Monitor upstream populations of *Arundo* and water hyacinth along Putah Creek to insure they do not spread to the Wildlife Area. Encourage the eradication of these colonies through participation in the Yolo County Weed Management Area.

    c. Continue monitoring of Iberian star thistle population established on the Tule Ranch.

3. Manage and control invasive and other nonnative species through specified grazing practices, controlled flood-up and drawdown procedures, use of pesticides, and other conventional agricultural practices.

    a. During the rosette growth stage of star thistle, apply Transline® for control of this invasive weed.

    b. Apply Telar® to perennial pepperweed stands during early growth stages in spring.

    c. Utilize grazing as a tool to control perennial pepperweed in the grazing areas of the Tule Ranch.

    d. Utilize grazing as a means of controlling perennial pepperweed in pastures and as an initial treatment in preparation for discing or Roundup® application for the control of jointgrass.

    e. Evaluate the effectiveness of monitoring and control methods periodically; adjust methods as needed.

    f. Coordinate with and support regional control efforts including the efforts of the Yolo County Weed Management Area.

    g. Continue coordination with Yolo County for the control of Iberian star thistle on the Tule Ranch.

h. Coordinate with DWR Division of Flood Management, Sacramento Flood Maintenance Office on management of invasive species on and adjacent to levees.

i. Provide education and outreach regarding impacts associated with invasive plants and control efforts.

j. Share results of control efforts with other Wildlife Areas and private habitat managers in the area.

k. Coordinate control efforts with needs of local farmers who share the use of the Mace Ranch Irrigation System.

l. Coordinate all actions with the DFG pesticide use programs. Ensure that all actions comply with the ESA and CESA and other regulations aimed at the protection of special-status species and sensitive habitats as well as current county and state regulations regarding the application of pesticides.

m. Maintain a consistent level of expertise in regards to pesticide use techniques and chemical effectiveness by requiring current pesticide applicator's certification for at least two on-site employees.

n. Consider and avoid unintentional effects to non-target plant species.

o. Avoid adverse effects to native forbs in Tule Ranch grassland communities as a result of herbicide applications for the control of star thistle.

p. Avoid adverse effects to agricultural crops in the area through drift in the air or water.

q. Coordinate herbicide treatments to avoid contact with visitors. Clearly identify dates, locations, and times of herbicide treatments to inform the public and facilitate closure of herbicide treatment areas.

Management goals for various species guilds have already been discussed. The following goals are less focused on particular groups of plants or animals, but instead establish broader-ecosystem wide goals.

5.2.1.4 SEASONAL AND PERMANENT WETLAND COMMUNITIES

Seasonal and permanent wetlands were once one of the dominant community types within California's Great Valley. Seasonal and permanent wetlands on the Yolo Bypass Wildlife Area can be divided into two separate groups: those that are actively managed to achieve maximum benefit to wildlife and those that are natural or are passively managed. The Yolo Bypass Wildlife Area is unique in that it preserves a large, contiguous block of land with representative examples of each wetland type. The Wildlife Area is further unique in that these wetland types are interspersed among one another, creating a diverse habitat matrix of various wetland types.

Actively managed seasonal and permanent wetlands are generally found in the original Yolo Bypass Wildlife Area, were reconstructed from bare ground, and are intensively managed by the DFG via a complex system of pumps, canals, and water control structures to flood and drain wetlands according to established prescriptions. Additionally, vegetation is disturbed by mowing, discing, or water management in order to maximize the habitat value of these lands.

Passively managed wetlands on the Yolo Bypass Wildlife Area include natural alkali marshes, vernal pools, and seasonal marshes. These areas are less intensely managed although usually some water control is still required to impound water. For example in the somewhat alkali area on the Fireman's Club, natural sloughs which were once on the shoreline of the vast Yolo Basin, subject to inundation during high water, complete with a tidal influence. Absent of this natural hydrology, this slough has two embankments built across its width, with water control structures installed. Water is delivered from the west into the slough, where it is backed up by the water control structure. Many of the vernal pool areas are affected by previous road construction efforts. Natural swales sweep to the southeast, draining small watersheds. When the swale encounters a road embankment, the water is

Natural slough of the Fireman's Club looking west

Flooded swale on the Tule Ranch

2004 wetland enhancement project workers

impounded, creating vernal pool conditions. These interruptions in the natural topography of the Tule Ranch are quite effective at creating the conditions necessary for the survival of these rare plants and animals of the vernal pools.

Within the heart of the Bypass on the southeast portion of the Tule Ranch remain low lying areas that were not leveled for agricultural purposes, but were instead utilized as open range for cattle and waterfowl hunting. Historically, small berms were constructed to impound water and the existing irrigation system was modified to deliver water to these "sinks." These wet areas were utilized as duck hunting clubs, named after their principle hunters. This was the location of the Martin's Pond and Slaviches. Currently, these low areas are the first place to flood and the last to drain, resulting is some of the same plant communities found further west in the vernal pool communities.

One field, adjacent to the toe drain is so low in elevation that it is subject to tidal inundation through a break in the west berm of the toe drain. This emerging fresh water tidal wetland represents a unique habitat type found no where else on the Wildlife Area.

The Seasonal and Permanent Wetland Ecosystems sub-element includes goals for management of these communities to maintain or enhance wetland species abundance and diversity (including special-status species), to prevent the spread of nonnative invasive species not beneficial to wildlife, and to restore and enhance degraded communities.

Seasonal and Permanent Wetland Ecosystems Goal 1 (SPW-1): *Following accepted scientific principles and practices, restore and enhance wetlands to conditions that provide desired ecological functions.*

Tasks:

1. Evaluate opportunities, constraints, and potential restoration benefits to identify feasible wetland restoration projects for intensely managed wetlands as well as the described more passively managed wetland areas. Potential restoration project sites may include the Tule Ranch Unit, Parker Unit, Los Rios Unit, South Unit, and Causeway Ranch.

2. Pursue funding and develop plans for identified restoration projects that include goals, techniques, costs, monitoring, an adaptive management process, and a schedule. Funding programs to pursue may

include the following:

a. North American Wetlands Conservation Act,

b. State Duck Stamp Program,

c. Upland Game Stamp Program,

d. U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Farm Bill Programs,

e. USFWS State Wildlife Grant Program, Federal Aid in Wildlife Restoration Program,

f. Central Valley Project, Wildlife Habitat Augmentation Plan,

g. Neotropical Migratory Bird Conservation Act Grants Program,

h. Riparian Joint Venture,

i. Ducks Unlimited, Wetland Restoration Program,

j. Department of Fish and Game Minor/Major Capital Outlay proposals,

k. DFG Comprehensive Wetlands Program,

l. Wildlife Conservation Board Inland Wetlands Conservation Program,

m. Other programs authorized under future bond acts,

n. DWR grants available for mitigation of water projects and levee maintenance activities,

o. Funding available through Yolo County Integrated Regional Water Management Plan,

p. Funding available through the Sacramento River Watershed Program,

q. Funding from grant programs administered by U.S. Environmental Protection Agency,

r. Funding from grant programs administered by National Oceanic and Atmospheric Administration,

s. Funding from grant programs administered by the National Fish and Wildlife Foundation,

t. Funding from grant programs administered by US Bureau of Reclamation,

u. Funding that becomes available as a result of programs to improve the Sacramento River Flood Control System by expanding the Yolo Bypass (including Sacramento Area Flood Control Agency),

v. Funding from the Yolo County NCCP.

3. Cooperate with development and implementation of existing restoration plans for wetland ecosystems by the CALFED ERP, North American Waterfowl Management Plan, Partners in Flight, United States Shorebird Conservation Plan, Waterbird Conservation for the Americas, Yolo County NCCP and other programs that are consistent with the goals of this LMP.

4. Coordinate habitat restoration acreages with goals developed for the Yolo Basin component of the Central Valley Joint Venture.

5.2.1.5 RIPARIAN COMMUNITIES

As with seasonal and permanent wetlands, riparian communities were once extensive in California's Central Valley. Historically, riparian areas occurred in broad bands within the floodplains of the streams and rivers draining from the Coast Ranges, Sierra Nevada, and Cascades. These rivers and streams flowed into the Sacramento and San Joaquin Rivers, which supported even broader bands of riparian communities. The vast majority of this community in the Central Valley has been lost to flood control projects, agriculture, and urban development. The riparian communities that remain are often restricted to the immediate stream border and are frequently less diverse due to the alteration of flood regimes, river flows, and the disturbance processes that create new riparian habitat and permit the succession of immature riparian communities into mature communities.

Within the Yolo Bypass Wildlife Area, riparian communities are restricted to narrow bands along Putah Creek, the East Toe Drain, and adjacent to some permanent wetlands. Despite the limited extent, riparian areas provide valuable wildlife habitat, particularly given their close proximity to grasslands, wetlands, and other communities within the Yolo Bypass Wildlife Area. As with many other riparian areas in the Central Valley, these communities are threatened by invasive plants, such as giant reed and alteration of hydrologic regimes.

Riparian habitat presents the greatest amount of hydraulic roughness to flood flows in the Yolo Bypass. For this reason, any potential riparian restoration projects require approval and permitting from the State Reclamation Board. Hydraulic analysis must be performed to guide the design of future restoration projects in the Wildlife Area and confirm achievement of performance criteria (i.e., confirmation that project-related adverse affects to flow conveyance will not occur). This analysis must be performed on a detailed restoration plan indicating locations, types and numbers of trees, as well as a description of the project's management. A hydraulic modeling workplan for guiding the design of future restoration projects in the Yolo Bypass Wildlife Area can be found in Appendix C.

Fragmented riparian vegetation along Putah Creek where it empties into the Yolo Bypass

The Riparian Community sub-element includes goals for management to maintain or enhance riparian species abundance and diversity and to restore and enhance degraded communities to provide desired ecological functions. Constraints to achieving these goals are primarily related to the maintenance of necessary flow conveyance throughout the Bypass.

Riparian Goal 1 (R-1): *Maintain and enhance riparian communities for native species diversity and abundance (including special-status species).*

A diverse abundance of native species including several special-status species are currently known or have the potential to be using riparian communities at the Yolo Bypass Wildlife Area. Comprehensive surveys for these species have not been conducted; thus their distribution at Yolo Bypass Wildlife Area could be more extensive than documented. Therefore, the results of surveys for these species would determine the need for and scope of the other tasks listed below.

Tasks:

1. Conduct surveys for wildlife and vegetation of riparian communities. The highest priority is to survey for special-status animals and plants that could be present in riparian ecosystems at the Yolo Bypass Wildlife Area but that are not yet known to occur, such as Northern California black walnut, California hibiscus, yellow-billed cuckoo, Mason's lilaeopsis, and Delta mudwort. It is also important to survey for other special-status species known to occur in riparian ecosystems. Regular monitoring of Swainson's hawk nesting efforts on or adjacent to the Wildlife Area should be continued.

2. Monitor populations of special-status species periodically to assess overall habitat integrity, detect changes in distribution and abundance, and detect positive and adverse effects of management activities, human use, and/or nonnative species.

3. After appropriate hydraulic analysis and receipt of Reclamation Board approval, improve habitat in the riparian ecosystems at the Yolo Bypass Wildlife Area through enhancement of existing riparian areas and establishment of new riparian habitats as permitted. Maintain and enhance riparian vegetation along Putah Creek and the East Toe Drain to provide nest trees and brush for resident and migratory songbirds, wading birds, and raptors.

4. Manage habitats in accordance with the operations and maintenance manual for the project modifications (as updated in supplement, U.S. Army Corps of Engineers 2003) to the Sacramento River Flood Control Project, pursuant to the MOU between DFG, State Reclamation Board, USFWS, and DWR regarding threatened and endangered species.

Riparian Goal 2 (R-2): *Restore and enhance riparian communities to conditions that provide desired ecological functions.*

This goal is based on DFG concerns and the goals and objectives of the CALFED ERP (for which DFG is an implementing agency). The preservation, enhancement, and restoration of riparian areas is a primary concern of DFG, as evidenced by the California Riparian Habitat Conservation Program (Chapter 4.1 of the Fish and Game Code). It is also a goal of the ERP to restore large expanses of riparian habitats. In addition to providing habitat for fish and wildlife species, restoring additional riparian vegetation along the Toe Drain would have the added benefit of protecting the east side levee from erosion by wind waves, if it can be accommodated without impeding conveyance or cutting into freeboard. This appears to be consistent with the USACE Operating Manual for the SRFCP, which states in Section IV 4-05b that "brush and small trees may be retained on the waterward slopes (of levees) where desirable for the prevention of erosion and wave wash" and that "where practicable, measures shall be taken to retard bank erosion by planting willows or other suitable vegetation on areas riverward of levees." A band of trees along the west side levee might also provide erosion protection if it can be accommodated without affecting other flood control parameters. As always, implementation of this concept would require approval of the Reclamation Board.

Opportunities for riparian community restoration and enhancement exist along the East Toe Drain, Putah Creek, and adjacent to permanent wetlands (e.g., Green's Lake) in certain areas. The tasks listed below represent a strategic approach toward restoring and enhancing riparian habitat in these areas.

Tasks:

1. Evaluate opportunities, constraints, and potential restoration benefits to identify feasible riparian restoration projects that would support the goals of this LMP. Riparian restoration projects may include new restoration areas or enhancement of existing restoration areas (e.g., seasonal and permanent wetlands) with riparian vegetation.

2. Pursue funding and develop plans for identified restoration projects that include goals, techniques, costs, monitoring, an adaptive management process, and a schedule.

3. Cooperate with development and implementation of restoration plans for riparian ecosystems by the CALFED ERP and other programs that are consistent with the goals of this LMP.

4. Design and manage riparian restoration and enhancement projects that would not conflict with necessary flood flow conveyance requirements of the Yolo Bypass. Ensure that proposed projects would not result in adverse effects on local or downstream flood hydrology and would comply with the requirements of the State Reclamation Board. Project planning will include necessary hydraulic modeling to guide design and confirm achievement of performance criteria. A work plan for hydraulic modeling is provided in Appendix C.

5.2.1.6 GRASSLAND AND UPLAND COMMUNITIES

Nonnative rabbit's foot grass

Grasslands across the Great Central Valley and other parts of California have been drastically altered over the last 300 years. During this timeframe, the native grassland flora, which consisted of a variety of perennial grasses, bulbs, and annual wildflowers, has been replaced by a variety of nonnative annual grasses and forbs of Eurasian origins. The shift from perennial to annual grasses as the dominant component of the grassland community has modified grassland community structure from a comparatively open and structurally diverse community to one characterized by dense vegetation with fairly homogenous structure. The Yolo Bypass Wildlife Area has not escaped this shift, with its grasslands dominated by the proliferation of annual rye grass.

Because of unique soil types and the propensity for upland areas to experience periods of soil saturation, a portion of the grasslands within the Yolo Bypass Wildlife Area are characterized by a higher occurrence of native wildflowers than many other grassland communities in the Central Valley. Grassland habitat structure within the Yolo Bypass Wildlife Area generally consists of nonnative Italian ryegrass with a diverse assemblage of native forbs supplementing the floral community on the western part of the Tule Ranch. Remnant native perennial grasses make their appearance on higher ground in this area, particularly along the eastern end of the Dixon ridge, an innocuous geographic feature dominated by Myers Clay soils.

The Grassland and Upland Ecosystems sub-element includes goals for management of this community to maintain or enhance grassland species abundance and diversity and to restore and enhance degraded communities to provide desired ecological functions.

Grassland and Upland Goal 1 (GU-1): *Maintain and enhance grassland and upland communities for diversity and abundance of native species (including special-status species).*

A diverse abundance of species including several special-status species are currently known or have the potential to be using grassland and upland ecosystems at the Yolo Bypass Wildlife Area. Comprehensive surveys for these species have not been conducted; thus their distribution at Yolo Bypass Wildlife Area could be more extensive than documented. Therefore, the results of surveys for these species would determine the need for and scope of the other tasks listed below.

Western meadowlark - common resident of upland communities

Tasks:

1. Conduct surveys for wildlife and vegetation in grassland and upland communities. The highest priority is to survey for special-status animals and plants that could be present in grassland and upland communities at the Yolo Bypass Wildlife Area but that are not yet known to occur, such as heartscale, San Joaquin spearscale, Colusa grass and Carquinez goldenbush. It is also important to survey for other special-status species known to occur in grassland and upland ecosystems at the Yolo Bypass Wildlife Area but for which much information is lacking, such as Ferris' milk-vetch, alkali milk-vetch, grasshopper sparrow, burrowing owl, and California horned lark.
2. Monitor populations of special-status species periodically to assess overall habitat integrity, detect changes in distribution and abundance, and detect positive and adverse effects of management activities, human use, and/or nonnative species.
3. Improve habitat for special-status species in the grassland ecosystems at the Yolo Bypass Wildlife Area through the adaptive management of livestock grazing, limited herbicide application, native grass plantings, and other management techniques.
4. Support existing populations of burrowing owls and increase breeding populations through the installation of artificial burrows.
5. Ensure that actions comply with the federal and California Endangered Species Acts and other regulations aimed at the protection of special-status species.

Grassland and Upland Goal 2 (GU-2): *Restore and enhance grassland and upland communities to conditions that provide desired ecological functions.*

This goal was selected because it could help DFG meet the LMP goal regarding native species abundance and diversity in grassland and upland ecosystems. The tasks listed below represent a strategic approach toward attaining this goal.

Tasks:

1. Evaluate opportunities, constraints, and potential restoration benefits to identify feasible grassland and upland restoration projects.
2. Pursue funding and develop plans for identified restoration projects that include goals, techniques, costs, monitoring, an adaptive management process, and a schedule.
3. Cooperate with development and implementation of restoration plans for grassland and upland ecosystems by the CALFED ERP and other programs that are consistent with the goals of this LMP.
4. Enhance grasslands and uplands through grazing, native grass plantings, and other management techniques.

AQUATIC ECOSYSTEMS

The Yolo Bypass provides vital fish spawning, rearing, and/or migratory habitat for a diverse assemblage of anadromous and resident fishes. Both native and nonnative species are common; however, as with most other aquatic habitats in California, nonnative species frequently dominate and compete with native fishes for

spawning, rearing, and feeding habitat. Additionally, nonnative fishes frequently prey upon native fishes, particularly juveniles which are susceptible to predation by higher level predators including black bass, striped bass, and other nonnative fish. However, many nonnative fishes provide significant angling opportunities, and the potential ecological impacts of nonnative fishes must be weighed against their value as a popular recreational resource.

While aquatic habitats in the Yolo Bypass Wildlife Area share many characteristics with similar habitats in the Central Valley, the Wildlife Area is unique in that it is managed as a large floodplain that is hydrologically connected to the Sacramento River (i.e., the Yolo Bypass) and the Sacramento-San Joaquin Delta. Historically, these floodplains were common the Central Valley and Delta and provided important spawning and rearing habitat for many native fishes. In addition to providing important habitat elements for many species of native fish, nonnative fish are less likely to make use of floodplain habitats because the spawning season for most nonnative fishes does not coincide with floodplain availability (i.e., inundation) and because floodplains are ephemeral in nature, thereby preventing the establishment of resident populations of nonnative fish. The relative lack of competition from nonnative fish, as well as the habitat complexity, flow regimes, and food web benefits provided by floodplains are particularly important to declining species such as Sacramento splittail and Chinook salmon.

In addition to supporting valuable floodplain habitat, the Yolo Bypass Wildlife Area also encompasses the lowermost segment of Putah Creek down to its confluence with the East Toe Drain. The reach of Putah Creek within the Wildlife Area (i.e., Putah Creek Cross Channel) consists primarily of a straight treeless ditch that is seasonally dammed by the Los Rios Check Dam. The one mile long riparian corridor above the Los Rios Check Dam is an extremely narrow swath with very few trees and steep banks.

The Los Rios Check Dam is currently being managed to optimize the migration of Chinook salmon into lower Putah Creek by removing boards in fall/winter in conjunction with pulse flow releases from the PDD. This action, along with upstream improvements have resulted in the recent return of small runs of fall-run Chinook salmon in the creek. The boards are typically removed in the fall/winter as soon as the irrigation season ends and upon the arrival of Chinook salmon in the East Toe Drain (based on DWR fyke trap sampling) and replaced in April of the following year (for agricultural and wildlife habitat uses).

Researcher conducting radio telemetry studies of spawning Sacramento splittail

The Aquatic Ecosystems sub-element includes goals for management of this habitat to maintain or enhance aquatic species abundance and diversity (including game species and special-status species), to maintain or enhance game species populations, and to restore and enhance degraded habitats to provide desired ecological functions.

Aquatic Ecosystems Goal 1 (AE-1): *Maintain and enhance aquatic ecosystems for diversity and abundance of native species (including special-status species).*

The California Endangered Species Act (Chapter 1.5 of the Fish and Game Code) declares that all state agencies shall seek to conserve threatened and endangered species. It is the policy of the California Fish and Game Commission to protect and preserve all native species experiencing a significant decline that, if not halted, would lead to their designation as threatened or endangered. DFG is also guided by the understanding that it is the desire of the State of California to recover salmon and anadromous trout populations to self-sustaining levels. Similarly, the goals of the CALFED ERP include achieving the recovery of at-risk native species dependent on the Delta and reversing downward population trends of native species that are not listed. The tasks listed below represent a strategic approach toward attaining this goal.

Tasks:

1. Monitor use of aquatic habitats at the Yolo Bypass Wildlife Area by special-status fish species.

2. Improve habitat for special-status fish species using aquatic habitats at the Yolo Bypass Wildlife Area (see Aquatic Ecosystems Goal 3 below).

3. Identify sites (e.g., permanent wetlands, ponds, Green's Lake) for reintroduction of native fish species (e.g., Sacramento perch).

4. Ensure that actions comply with the ESA and CESA and other regulations aimed at the protection of special-status species and are in accordance with the MOU between DFG, USFWS, DWR, and the State Reclamation Board.

Aquatic Ecosystems Goal 2 (AE-2): *Maintain and enhance habitat for game fish species.*

It is the policy of the California Fish and Game Commission that DFG shall emphasize programs that ensure continued sport fishing opportunities, enhance such opportunities, and prevent their loss. It is also commission policy that DFG work toward stabilizing and then restoring the declining native fishery of the Delta. The enhancement of fisheries for white sturgeon and the maintenance of fisheries for striped bass and nonnative warm water fish are objectives of the CALFED ERP. The tasks listed below represent a strategic approach toward upholding these policies and objectives.

Tasks:

1. Monitor and assess management, human use, invasive nonnative species, and other effects on habitat for desired game species.

2. Evaluate access points, angling use, and regulations periodically; recommend changes as warranted to maintain and enhance aquatic habitats and populations of game species.

3. Improve habitat structure in permanent wetlands for the benefit of game fish species.

Aquatic Ecosystems Goal 3 (AE-3): *Restore and enhance aquatic ecosystems to conditions that provide desired ecological functions.*

Substantial achievements have been made to restore habitat and improve flow regimes throughout the lower Putah Creek watershed. These efforts have resulted in the historic return of small Chinook salmon spawning runs in the lower creek in recent years. Continued efforts are ongoing to address remaining limiting factors through additional collaborative restoration planning and implementation. The DFG supports the continued restoration efforts in the lower Putah Creek watershed, especially those opportunities that exist in the lowermost segment of Putah Creek that runs through the Yolo Bypass Wildlife Area.

This goal includes tasks to restore and enhance aquatic habitat and passage in the segment of Putah Creek flowing through the Wildlife Area, restoration of intertidal marsh habitat adjacent to the East Toe Drain, and reintroduction of rare native species including Sacramento perch into appropriate water bodies throughout the Wildlife Area.

The restoration of aquatic habitat at the Yolo Bypass Wildlife Area could contribute to attainment of this LMP's goals regarding habitat for special-status and game species. Opportunities exist to enhance habitat and improve fish passage along Putah Creek and at the southeast portion of the Tule Ranch Unit adjacent to the East Toe Drain. The tasks listed below represent a strategic approach toward enhancing habitat and improving fish passage in these areas.

Tasks:

1. Identify opportunities to restore aquatic ecosystems at the Yolo Bypass Wildlife Area. Cooperate with development and implementation of restoration plans for aquatic ecosystems by the CALFED ERP and other programs that are consistent with the goals of the Yolo Bypass Wildlife Area and this LMP. Potential projects may include the following:

    a. Creating a new realigned Putah Creek channel through the Tule Ranch Unit (Putah Creek from above the Los Rios Check Dam to the East Toe Drain below the Lisbon Weir).

    b. Exploring the potential for restoration of intertidal marsh habitat and/or seasonal managed floodplain habitat at the southeast portion of Tule Ranch adjacent to the East Toe Drain for the benefit of native fish species such as splittail. Certain bird species such as black rail may also benefit.

    c. Independent of Goal 1, consider improving coordination and enhancement of spring passage of Chinook salmon smolts emigrating from Putah Creek through the Los Rios Check Dam to the East Toe Drain.

        i. Coordinate annual replacement of the check dam after the arrival of spring water releases from the Solano Diversion Dam intended to move salmon smolts from Putah Creek into the toe drain.

        ii Consider the construction of a fish passage facility at the check dam to move adult salmon upstream and smolts downstream.

    d. Restore native fish to Green's Lake and permanent ponds including Sacramento perch. Stocking of this fish species may also serve as a biological control agent for mosquitoes.

2. Continue coordination and enhancement of fall passage of Chinook salmon immigrating from the East Toe Drain through the Los Rios Check Dam to Putah Creek. Currently, when fish are detected in the Toe Drain, based on fyke trapping results conducted by the DWR, a sequence of events is initiated. If local farmers and Wildlife Area staff are through utilizing the check dam for irrigation and flood up, its removal is scheduled. A release of water from the Putah Diversion Dam is directed to arrive at the Los Rios Check Dam at the same time the flash boards are being removed. The combined flows from the Diversion Dam coupled with the head of water released from the check dam act as an attraction flow to entice salmon into Putah Creek.

    a. Consider the construction of a fish passage facility at the Los Rios Check Dam to allow passage of adult salmon upstream and juveniles downstream while still maintaining the Los Rios Check Dam in place.

    b. Improve Lisbon Weir for both the passage of anadromous salmon into Putah Creek and increased water capture efficiency for irrigation purposes.

3. Pursue funding and develop plans for additional potential aquatic ecosystem restoration projects.

4. Design and manage restoration and enhancement projects that would not conflict with necessary flood flow conveyance requirements of the Yolo Bypass, as determined through the application of hydraulic analysis. A work plan for hydraulic modeling is provided in Appendix C.

5. Ensure that actions comply with the ESA and CESA and other regulations aimed at the protection of special-status species and/or sensitive habitats.

6. Design and operate restoration and enhancement projects in coordination with the SYMVCD. Project design and operation shall include technical BMPs for mosquito control in managed wetlands developed by the CVJV (Kwasny et al. 2004).

5.2.2 AGRICULTURAL RESOURCES ELEMENT

Harvesting of milo

Agriculture has been an important land use in the Yolo Bypass since the seasonal wetlands and perennial marsh and riparian areas were first converted to farms in the mid-1800s. For many years, grazing was the primary use of agricultural lands in the Yolo Bypass. In the latter part of the 20th century, irrigation systems were developed and fields were engineered for the production of row and truck crops. The local climate and nearly annual floods that flow through the Yolo Bypass severely limit the kinds of crops that can be grown. Orchards and winter crops are not an option, nor are long term ventures such as alfalfa. The proximity of the Yolo Bypass to the San Francisco Bay system brings a cool prevailing wind from the south during summer evenings. Although the daily appearance of this Delta Breeze makes life bearable in the Sacramento area, it limits the production of rice to wild rice, or special varieties that are more adapted to the climate.

Row and truck crops are currently grown across the northern half of the Yolo Bypass Wildlife Area (i.e., Causeway Ranch and Los Rios Farms Complex) and on the northern portion of the Tule Ranch. The primary crops grown include: rice, corn, millet, milo (grain sorghum), safflower, sunflower, and tomatoes. These crops are cultivated during the summer months. From fall to spring, farmed areas are fallowed and grain crops are flooded to provide a valuable source of forage for wildlife as well as seasonal wetland habitat. Three common crop rotations are: 1) corn to safflower/sunflower to tomatoes; 2) wild rice to wild rice to conventional rice; or 3) rice to rice to shorebird habitat (fallowed rice fields that are flooded to a shallow depth during July and August).

Rotation strategies are designed to provide a diversity of wildlife habitat elements and to facilitate sustainable agricultural practices (e.g., maintain soil fertility and reduce herbicide application). Other crops, (e.g., millet, milo, safflower, and sunflower) are occasionally planted to provide supplemental sources of wildlife forage. These crops may be planted as part of one of the three above rotation strategies or may be periodically planted on fields designated solely for wildlife forage production.

Cattle grazing occurs primarily on an extensive portion of the Tule Ranch Unit in the southern end of the Yolo Bypass Wildlife Area. Additional grazing, specifically for vegetation management, occurs throughout many of the remaining portions of the Yolo Bypass Wildlife Area. Cattle are often used as an initial treatment of vegetation prior to discing or spraying with herbicide. Animals are brought onto the Yolo Bypass Wildlife Area in mid spring or early summer after the threat of flooding has passed and they are removed by November. Forage is provided in irrigated pasture, uplands within the Bypass, and the annual grasslands-vernal pool complex.

GOALS

Given the prevalence of land within the Yolo Bypass Wildlife Area suited to agriculture, many of the management units incorporate some form of agriculture at least on an occasional basis as a management tool. In general, agricultural activities contribute to Yolo Bypass Wildlife Area goals. Listed below are several goals and tasks identified for the agricultural element. Because of the tightly interrelated and coordinated nature of agricultural activities with other management in the Yolo Bypass Wildlife Area, several of these tasks may be redundant with those identified in other elements throughout this chapter.

Agricultural Resources Goal 1 (AR-1): *Use agricultural techniques to maintain and enhance habitat for native wildlife and plants.*

Snow geese and cattle sharing the irrigated pasture

DFG wildlife areas commonly grow agricultural crops for the benefit of wildlife. The Yolo Bypass Wildlife Area utilizes agriculture to manage habitats while providing important income for the management and operation of the property. Many innovative, natural resource-compatible agricultural practices occurring in the Yolo Bypass Wildlife Area provide valuable habitat for a diverse assemblage of wildlife species. Rice is grown, harvested, and flooded to provide food for thousands of waterfowl. Corn fields are harvested to provide forage for geese and cranes. Working with local farmers, the Yolo Bypass Wildlife Area provides fields of milo, corn, and sudan specifically for wildlife forage purposes. Crops such as safflower are cultivated and mowed to provide seed for upland species such as ring-necked pheasant and mourning dove. Much of the grassland in the southern portion of the Yolo Bypass Wildlife Area is managed with cattle grazing, resulting in spectacular blooms of wildflowers during the spring months. The predominance of nonnative annual grasses in that area can otherwise inhibit the production of the native plant community that includes several rare and endangered species. Whereas historically pronghorn antelope and tule elk grazed competing native grasses, exposing the emerging forbs to sunlight, grazing cattle provide this function today, eating the mostly nonnative competing grasses. Due to the aggressiveness of these nonnative grasses, an aggressive grazing strategy is needed to favor the production of native forbs.

Tasks:

1. Manage and control invasive nonnative plant species through specified grazing practices, controlled flood-up and drawdown procedures, use of pesticides, and other conventional agricultural practices.

2. Enhance grasslands and uplands through grazing, native grass plantings, and other management techniques.

3. Work with adjacent property owners to limit aerial seeding of Italian ryegrass in areas that would support native alkali grassland under natural conditions.

4. Improve habitat for special-status species in the grassland ecosystems at the Yolo Bypass Wildlife Area through the adaptive management of livestock grazing, limited herbicide application, native grass plantings, and other management techniques.

5. Manage for rodents and large insects to provide adequate prey items in order to benefit foraging raptor species.

    a. Plant food plots that will not only provide food for birds, but rodents as well. Legumes and grain crops such as vetch, clovers, wheat, sunflower, milo, corn, and safflower are recommended.

    b. Manage discing, mowing, and summer irrigation to attract large numbers of Swainson's hawks, which feed on grasshoppers.

    c. Manage fall flooding of agricultural fields to attract wintering raptors.

6. Annually plant grain fields to provide foraging areas for upland game and hunting opportunities for upland game hunters.

7. Manage seasonal and permanent wetlands and other communities to provide habitat for resident waterfowl species.

    a. Disc, mow, burn, and/or graze vegetation as necessary to promote desirable species, eliminate species not valuable for wildlife (e.g., cocklebur), promote a higher quality seed bed for the following year and to maintain required ratios of open water after fall flood up.

    b. Flood rice fields as early as possible after harvest is completed to attract migratory waterfowl.

8. Manage upland vegetation to provide desired nesting habitat.

    a. Plant fields of wheat and vetch to provide high quality nesting habitat the following year.

9. Manage agriculture for shorebird species through newly developed shorebird/rice rotation.

    a. *July 1:* Flood shallow unplanted rice fields which have been disced at least twice.

    b. *July 1 through end of August:* Maintain shallow water.

    c. *September 1:* Drain fields, disc weeds and prepare field for rice planting to occur in the following spring.

10. Perform field preparation of some agricultural fields in the fall in order to present disced field habitat for species that utilize this habitat such as horned larks, longspurs, and mountain plover.

Agricultural Resources Goal 1 (AR-2): *Manage agricultural lands to contribute to the agricultural community, to maintain agriculture as a viable economic activity in Yolo County, and to provide revenue for continued operation of the Wildlife Area.*

At the time of the acquisition of the Glide and Los Rios properties, one concern expressed by the agricultural community was regarding the loss of farm land to wildlife habitat. DFG made a commitment at that time to maintain the existing agricultural leases present on the property and to integrate agriculture into the long term management of the Wildlife Area. The Yolo Bypass Wildlife Area is now seen as a model for bridging the seemingly disparate fields of agriculture and wildlife management. Practices used in agriculture and wildlife management are not that far apart. The success of this management philosophy is best epitomized by the land management approaches implemented in the Yolo Bypass Wildlife Area where agricultural lands are leased to local farmers and managed, under an agreement with DFG, by the Dixon RCD. These tenants work in cooperation with DFG to grow a variety of agricultural crops and to manage livestock grazing for wildlife and native plant habitat management.

Revenues from agricultural leases provide valuable operating income for the Yolo Bypass Wildlife Area. These revenues are viewed as vital for continued operation and management of the Wildlife Area. The DFG has an agreement with Dixon RCD to manage agricultural leases and other agriculture-related activities occurring in the Yolo Bypass Wildlife Area. Dixon RCD staff has made invaluable contributions towards DFG's goal of integrating agriculture into the long-term management of the Wildlife Area.

Integration of agriculture into the long term management of the Wildlife Area contributes to attainment of this LMP's goals regarding contribution to the local agricultural community while providing habitat for wildlife species. The tasks listed below are intended to represent DFG's approach toward continued contribution to the local agricultural community.

Tasks:

1. Work with local farmers to grow agricultural crops that mutually benefit the farmer lease tenants, the agricultural community, and the Wildlife Area.

2. Manage agricultural lands to provide an income source for DFG management and operations of the Wildlife Area.

3. Administer agricultural leases as necessary in cooperation with staff from the Dixon RCD.

    a. Annually plan agricultural activities throughout the Wildlife Area including production fields and wildlife food plots.

    b. Coordinate desires of lessees with limitations of Mace Ranch Irrigation System and its other users.

    c. Plan for administration of Farm Service Agency funds to lessees and reciprocal services to be provided to Wildlife Area.

    d. Periodically inspect agricultural activities throughout the year.

    e. Plan for the post harvest treatment of agricultural fields.

4. Maintenance of water management infrastructure including pumps, water control gates, and water distribution system performed by DFG, agricultural lease tenants, and cooperatively by members of the Mace Ranch Irrigation System.

5. Meet or correspond with adjacent landowners and tenants as needed individually or through the Yolo Bypass Working Group to maintain communication about regional agricultural issues, management needs of the Yolo Bypass Wildlife Area, determine adjacent landowners' access and management needs, and convey useful information regarding activities.

6. Work with local agriculture community to provide information on wildlife friendly farming approaches used the Wildlife Area.

7. Collaborate with adjacent landowners and tenants regarding DFG management activities that may affect their operations. Resolve potential issues by proactively working with adjacent landowners and tenants.

8. Collaborate with adjacent special districts including Dixon RCD, Reclamation District 2068 and Yolo RCD.

5.2.3 CULTURAL RESOURCES ELEMENT

Cultural resources at Yolo Bypass Wildlife Area are limited. DFG is not aware of any significant historical or archaeological resources at the Yolo Bypass Wildlife Area. Consequently, there are few opportunities or constraints on the management of cultural resources at the Yolo Bypass Wildlife Area. Nonetheless, significant historical or archaeological resources may be present and could potentially be affected by public uses or management actions, particularly ground-disturbing activities in areas not yet surveyed. Potential ground-disturbing activities include levee maintenance by DWR and restoration of ecosystems by DFG or other agencies in collaboration with DFG. (See also Public Use Goal 7 below for additional goals related to cultural resources.)

Chapter 3, "Environmental Setting," contains additional information regarding cultural resources of the Yolo Bypass Wildlife Area.

Cultural Resources Goal 1 (CR-1): *Catalog and preserve all cultural resources that have yielded or have the potential to yield information important to the prehistory or history of the Yolo Bypass Wildlife Area or that otherwise would meet significance criteria according to the California Register of Historical Resources (CRHR).*

This goal is based on CEQA requirements and on DFG's intent to provide long-term stewardship of cultural resources at the Yolo Bypass Wildlife Area. The tasks listed below represent a strategic approach toward providing such stewardship.

Tasks:

1. Maintain library of printed cultural resource reports from the vicinity.

2. Conduct cultural resource surveys as necessary before significant ground-disturbing activities (e.g., excavations below normal plow depths) at undisturbed sites.

3. Complete and submit site records to the State Historic Preservation Officer (SHPO) to establish and submit culturally significant resources that may be eligible for inclusion in the National Register of Historic Places (NRHP) or the CRHR.

4. When facility improvements or restoration efforts are proposed and may affect historical or archaeological resources, consult the State CEQA Guidelines for guidance on compliance with regulations. Consult with the California Native American Heritage Commission as appropriate.

5. Maintain historic structures present on site including the Tule Ranch main residence and the umbrella barn.

5.2.4 AUTHORIZED-PUBLIC-USE ELEMENT

It is the policy of the California Fish and Game Commission that lands under its administration be available to the public for wildlife-dependent recreational use whenever such uses will not unduly interfere with the primary purpose for which such lands were acquired. The Yolo Bypass Wildlife Area was acquired for the primary purpose of providing habitat for resident and migratory bird species. Various compatible, wildlife-dependent uses authorized and ongoing at the Yolo Bypass Wildlife Area are listed below.

The Yolo Bypass Wildlife Area presents a unique opportunity to affect the environmental awareness of unlimited numbers of people due to the proximity of its spectacular wildlife numbers to the urban environment of the Sacramento area. This mix of humanity and the natural world lie at the heart of the Yolo Bypass Wildlife Area and illustrate the mutual goals shared by the Yolo Basin Foundation (Foundation) and the DFG. Each organization has extended themselves towards achieving a common desire of getting people into the habitats of the Yolo Basin and appreciating what they experience there. This successful working relationship is memorialized in a MOU between the DFG and Foundation (see Appendix D) and has resulted in nine years of visitors enjoying docent lead walks, guest speakers, educational field activities, hunting adventures, special events, as well as the spectacle of thousands of waterfowl lifting off from the Wildlife Area's rice fields at the north end or the aroma of thousands of acres of wildflowers on some of California's last remaining wild prairie at the south end.

Opportunities for public uses at the Yolo Bypass Wildlife Area include hunting, angling, walking, hiking, vehicle touring for wildlife observation, nature study, and environmental education and interpretation. There is also significant potential for gathering of native plant materials for cultural uses. Other types of nature study include photography, drawing, and painting.

There are currently also several important constraints on public use of the Yolo Bypass Wildlife Area. These constraints include:

- limited availability of staff and funding for operations such as opening and closing of gates, garbage collection, visitor use coordination, and law enforcement.
- limited availability of staff and funding for maintenance of roads, trails, parking lots, fencing, and signs.
- limited public access to Yolo Bypass Wildlife Area management units, due to a lack of roads, ditch crossings, and parking lots.
- other management activities such as farming, presence of heavy equipment for farming and habitat maintenance can present safety problems for smaller vehicles, pedestrians, and bicyclists.
- environmental factors such as flooding that prevents access and presents significant safety risks to the public.
- access to the Yolo Bypass Wildlife Area from the West Sacramento side is limited by the lack of Toe Drain crossings and the east side levee access is controlled by local reclamation districts, primarily RD 900 and RD 999:
    - access to the Yolo Bypass Wildlife Area from the west levee of the Yolo Bypass south of the entrance gate is controlled by the DWR and thus not available to the public.
- roads are graveled with large size gravel to withstand flooding making for rough terrain. Ungravelled levees can have large cracks during the dry season. These factors present safety risks for bicycling.
- potential effects of human disturbance on wetlands, agricultural areas, riparian areas, grasslands and uplands, and aquatic ecosystems of the Yolo Bypass Wildlife Area.
- potential effects of human disturbance to wildlife including frightening wildlife, flushing of wildlife from habitat, disturbance while roosting, and noise disturbance.
- potential effects of human disturbance to wildlife during breeding and nesting season.
- the need to prevent access to sanctuary areas which are closed to public use.
- potential effects on cultural resources.
- incompatibility of various public uses (for example hunting and wildlife viewing cannot be accommodated in the same area).
- the need to exclude public use during pesticide applications for agriculture, vector control, and invasive species management.
- conflicts between vehicle traffic, bicycles, and pedestrians.

Chapter 3, “Environmental Setting,” contains additional information regarding public uses of the Yolo Bypass Wildlife Area.

Public-Use Goal 1 (PU-1): *Increase existing and provide new long-term opportunities for appropriate wildlife-dependent activities by the public.*

The Yolo Bypass Wildlife Area is located along the heavily traveled I-80 corridor and within the growing Sacramento metropolitan area, making it among the most accessible wildlife areas in the state. As the region’s population grows and the need for open space activities increases, the Yolo Bypass Wildlife Area will become an increasingly important place for the public. DFG acquired the Yolo Bypass Wildlife Area, in part, to provide opportunities for wildlife-related activities. Uses that have been actively managed for the non-hunting public include wildlife observation and nature study by foot and vehicle on trails and roads.

There is a five-mile driving loop for observation of wildlife from vehicles. This route is open all year except during flooding. There are several turnouts along this route. Other roads are open to non-hunter vehicle access except during the hunting season. The potential exists to improve this tour route by enlarging its length and modifying it to improve wildlife viewing. The current route loops back in a linear fashion creating a long, narrow natural area. Wildlife is often frightened away by the first vehicle in the morning. A loop that encompasses a larger area with increased wildlife cover will encourage wildlife use adjacent to viewing areas. Research conducted at the Sacramento River National Wildlife Refuge has shown that vehicles cause the least disturbance to wildlife when compared to both people on foot or on bicycles, thus improving the wildlife viewing experience and minimizing disturbance to wildlife. It is recognized that many people would rather enjoy the experience by being outside of their vehicles. It is anticipated that the future tour loop will include both an area in which people are required to stay within their vehicles and areas where hiking is encouraged.

Trails are located primarily on the raised areas between ponds. Some trails are marked by signs and are mowed once a year to keep them more accessible. Most trails leave from a designated parking lot. Some trails are open all year but those located in hunt areas are closed to non-hunters during hunting season. There is one maintained trail with limited interpretive signs that starts at parking lot D. The potential exists to expand marked trails and provide more signage. Picnic tables are currently located at parking lots B, C, D, F, and G. Portable toilets are also located at these same lots. An accessible portable toilet is currently provided at parking lot C.

Bird watching in the Yolo Bypass

The population of West Sacramento is growing and the Yolo Bypass Wildlife Area is increasingly seen as a resource for the city's residents. There is some interest in making the Wildlife Area accessible from the east side levees. DFG and Foundation staff has met with representatives of the city to explore this option. East side access would have to overcome some complex problems including crossing the East Toe Drain. Currently much of the east side of the Wildlife Area is open for hunting during waterfowl season. Conflicts with this use would also have to be resolved. There has also been some interest expressed in providing equestrian access from the east side. DFG will cooperate in discussions to explore the potential for regional equestrian trail linkages, but it is not anticipated that equestrian use of trails will be encouraged at the Wildlife Area.

Tasks:

Tasks for maintaining and improving wildlife observation:

1. Expand existing northern auto tour route to encompass portions of the Causeway Ranch and 1,000 Acre units.

2. Evaluate potential to develop a new southern auto tour route in the same manner for the Tule Ranch Unit.

3. Designate about half of the length of each tour route for vehicle access only while encouraging out of vehicle wildlife viewing from parking lots and turnouts on at least half the length of the tour routes.

4. For all wildlife viewing areas, manage existing routes and design future habitat enhancements to provide adequate vegetative screening to protect wildlife while providing viewing areas into created openings, highlighting slough channels, islands, and wildlife resting areas.

5. Develop interpretive signage for wildlife viewing roads and trails.

6. Develop viewing blinds, observation towers, and board walks where appropriate.

Tasks for maintaining and improving angling:

7. Develop maps and signs that indicate fishing access points.

8. Post fishing regulations in appropriate locations.

9. Build access points for anglers with limited mobility along East Toe Drain.

10. Coordinate with DFG "Fishing in the City" program to provide additional angling opportunities.

11. Expand spring bow fishing program to include all areas within the hunting area during the non hunting season.

Pre junior hunt safety meeting

Tasks for maintaining and improving hunting:

12. Continue current hunting program.

13. Expand hunting opportunities as habitat and access is improved on the Tule Ranch and Causeway Ranch units.

14. Consider use of boats in specified areas.

15. In the interest of maintaining a historical use of the Yolo Bypass, consider means of allowing boat access from the Yolo Bypass Wildlife Area to the Bypass during flooding periods, without incurring any liability to the State of California.

16. Continue to work with local farmers to grow agricultural food plots in order to provide improved hunting opportunities.

17. Locate waterfowl sanctuary areas to enhance hunting experience while providing adequate resting areas.

18. Maintain physical separation of hunting areas from non-hunting areas during hunting season. Open hunting areas to other uses following end of hunting season.

19. Evaluate feasibility of moving all hunting to Tule Ranch area with potential check station at the Tule Ranch Headquarters. This would separate wildlife viewing areas from hunting areas in a north-south direction rather than the current east-west situation.

20. Communicate with neighboring duck clubs to identify Yolo Bypass Wildlife Area management strategies that may affect waterfowl hunting opportunities on their properties. Coordinate Yolo Bypass Wildlife Area management strategies to provide mutual benefits (e.g., managed movement and spread of local bird densities, location of sanctuaries) for the Yolo Bypass Wildlife Area and neighboring lands.

21. Continue recruitment of new hunters by providing hunter safety instruction on a regular basis at the Wildlife Area headquarters.

22. Continue encouragement of young hunters through participation in junior hunt programs for waterfowl and pheasants.

23. Conduct late summer "clean up day" to ready the Wildlife Area for the upcoming hunting season and maintain good relationship with the hunters.

24. Consider providing falconry opportunities for the purpose of taking upland game and waterfowl on the Yolo Bypass Wildlife Area in accordance with falconry regulations and season dates adopted by the State Fish and Game Commission.

Tasks applicable to all uses include:

25. Evaluate use levels and visitor satisfaction periodically.

26. Evaluate the hunting, angling, and wildlife viewing programs and Wildlife Area regulations periodically to identify changes that are warranted to maintain consistency with the goals of this LMP.

Public-Use Goal 2 (PU-2): *Support and expanded public use of the* Yolo Bypass Wildlife Area *for environmental education and interpretation.*

School children learn about pond invertebrates

This goal is based on policies of the California Fish and Game Commission and the mission of the Foundation. It is the policy of the California Fish and Game Commission that, to the maximum extent feasible, DFG shall disseminate information to the public regarding conservation, protection, and management of the state's fish and wildlife resources. It is also a policy that DFG shall encourage education programs that increase the public's respect and concern for wild animals, and their knowledge of the interrelationships between wild animals, their environment, and their human neighbors. As stated in the Foundation's mission, the foundation is "dedicated to the stewardship and appreciation of wetlands and wildlife through education and innovative partnerships." DFG and the Foundation have a unique and very successful partnership at the Yolo Bypass Wildlife Area that supports a diverse education program.

The objective of the program is to encourage the public's awareness of the presence and importance of wetlands in their environment and increase their understanding of issues that impact these ecosystems by providing various educational opportunities for the public through school programs, field experiences, and special programs. The programs provide easily accessible field oriented learning opportunities to the large regional student/teacher population and the general public.

The primary feature of the environmental education program at the Yolo Bypass Wildlife Area is entitled "Discover the Flyway." This program is operated cooperatively with DFG Wildlife Area staff.

The objective of the Discover the Flyway program for schools is to make wetlands and their stewardship, in the context of the Yolo Basin, a consistent educational component in the schools of the Sacramento region.

The Discover the Flyway program takes an ecosystem approach to educating teachers and students about wetlands: ecosystem relationships, habitats, species composition, human and natural threats, and compatible land uses.

These programs have developed over that last decade to a point where 4,000 K–12 students and hundreds of teachers and parents participate in the Discover the Flyway Program. The participants come from at least

15 school districts in Sacramento, Yolo, Solano, Placer, and El Dorado Counties. Significant numbers of students from private schools and home school networks also participate.

Training workshops provide teachers with the experience to successfully lead classroom and field studies in the Yolo Bypass Wildlife Area. The program offers teachers, subsequent to participating in their first workshop, staff support and equipment for classroom field trips to the Yolo Demonstration Wetlands (located at the DFG Headquarters site) and the Wildlife Area.

The workload associated with this program includes advertising and outreach, teacher and volunteer training, scheduling class visits and volunteers, working with the teacher to plan pre trip activities, 3–4 field activities, and post visit activities. The Wild About Wetlands Kits, with a wide range of classroom activities, are available for teachers to check out prior to their visit. The kits need regular maintenance and updating.

The Foundation provides a staff person to lead the field trip, volunteers to run activity stations, and binoculars and scopes. DFG maintains the Demonstration Wetlands at the Headquarters site, provides the maintenance needed for trail access at the Wildlife Area, coordinates the use of volunteers, provides a portion of the education tools and materials and assists in the development of new programs.. Foundation staff coordinates with DFG to determine where to take the students. Trips are scheduled four days of the week. One day is set aside to allow for road and habitat maintenance. Pesticide use is coordinated so that spraying activities do not take place while students are present.

School children learning about "migration madness"

Tasks:

Tasks to support kindergarten through 12th grade environmental education:

1. Provide Teacher Training Workshops at least four times a year.

2. Maintain Wild About Wetlands kits for pre and post trip activities.

3. Provide and maintain curriculum materials and field equipment.

4. Provide other workshops and educational activities:

   a. Project Wet: This is a K–12 teacher workshop on water topics offered in cooperation with DFG.

   b. Salmonids in the Classroom: This project sponsored by DFG and local fly-fisher groups, offers teachers curriculum and aquarium supplies to grow salmon eggs to the fry stage and release them in the Sacramento River.

   c. Introduction to Watershed Education: This is a workshop co-hosted with the Water Education Foundation to teach 8th–12th grade teachers how to measure and monitor for parameters of water quality, including nutrients, and bioassessment.

   d. Nature Bowl: This is an event for 3rd–6th graders held at the Yolo Bypass Wildlife Area to promote learning about natural systems and the local environment. The event is co-sponsored with DFG and Yolo County Office of Education.

e. Marsh Madness: The Foundation works with CWA to target under served schools twice a year for a full day of field activities. Bus transportation and a wetlands lunch buffet are provided. CWA provides the lunch, tables and chairs, and volunteers for the day.

5. Creation and maintenance of curriculum workbook with activities adapted to the State science framework and environmental education guidelines. The Foundation is also implementing a new curriculum that meets state social studies standards for 4th–6th grade.

Public education extends beyond K–12 students to include all ages. There are multiple education programs for the general public.

Tasks to support environmental education for people of all ages:

Spring field trip to vernal pools

6. Foundation volunteers are scheduled to lead monthly public field trips to the Yolo Bypass Wildlife Area

7. Scheduling and providing publicity for monthly Flyway Nights Lecture Series.

8. California Duck Days – DFG and YBF host the annual California Duck Days Wetlands Festival in partnership with a volunteer steering committee. The steering committee, in addition to DFG and Foundation staff, includes representatives from Central Valley Joint Venture, City of Davis, CWA, Yolo and California Audubon, and Conaway Ranch. This a huge effort requiring the scheduling of dozens of volunteers, arranging for field trip and workshop leaders, and preparing the Wildlife Area headquarters site for the event.

9. Publicizing and scheduling of summer and spring guided tours at sunset to view the flyout of thousands of Mexican free-tail bats from under the Causeway.

10. Publicizing and scheduling guided spring tours and open house events to view the Tule Ranch vernal pools.

    a. Special tours for other organizations (USACE [watershed training course four times/year], American River Conservancy docents, Sacramento Zoo staff, Elkhorn Slough docents, visiting dignitaries from other countries, and many others.)

    b. Jepson Prairie/Tule Ranch vernal pool docent training course.

11. Other events hosted by others in which DFG and the Foundation participate require varying amounts of preparation and presence:

    a. Salmon Festival at Nimbus Hatchery

    b. Earth Day at the Sacramento Zoo

    c. International Migratory Bird Day

    d. Celebrate Davis Chamber of Commerce event

    e. Sandhill Crane Festival

f. Make presentations to various service clubs, chambers of commerce, university classes, educational conferences

12. Educational Materials for Loan:
    a. Wild About Wetlands kits
    b. Birds of Yolo Bypass Wildlife Area PowerPoint
    c. Books and videos
    d. Soil testing kits
    e. Binoculars


YOLO FLYWAY

New Species Discovered in Yolo Bypass

Yolo Wildlife Area Management Plan Is On Its Way

Bucks for Ducks

October 15, 2006

Yen Memorial Center, Davis

Yolo Flyway newsletter is published quarterly

13. Outreach and communication includes "Yolo Flyway" newsletter three times a year, press releases, articles in regional newspapers and periodicals, public service announcements on television and radio, listserve announcements and maintenance of information presented on the Yolo Basin Foundation website.

14. Develop and distribute interpretive materials including brochures, plant and wildlife and tour guides, interpretive displays and signs.

15. Develop new programs as time and budget allows.

Public-Use Goal 3 (PU-3): *Coordinate public access to and use of facilities including tour routes, parking areas, Putah Creek, the planned Pacific Flyway Center, and other areas to accommodate a variety of different user groups.*

Opportunities exist to maintain and expand tour routes throughout the Yolo Bypass Wildlife Area and to coordinate with and participate in regional trail planning efforts. Constraints include increased disturbance of wildlife and other natural resources as a result of increased public use.

Access Tasks:

Entrance to Yolo Bypass Wildlife Area

1. Provide a large sign marking the Yolo Bypass Wildlife Area entrance.

2. Improve physical and design aspects of Yolo Bypass Wildlife Area entrance, with the goal of making this area more inviting (potential improvements include creating a scenic wetland area at the entrance and increasing the ability to pass water under this road during periods of high water flows).

3. Provide Watchable Wildlife signs on I-80 and County Road 32b.

4. Coordinate with Watchable Wildlife program, visitor and convention bureaus and others to provide for accurate Yolo Bypass Wildlife Area descriptions and directions in printed materials and on the web.

Roads

5. Maintain access routes to all open facilities and parking lots.

6. Maintain and improve existing tour loop.

7. Develop a new southern auto tour route.

8. Construct all roads with natural/gravel surface with minimal maintenance requirements.

School children on Wildlife Area trail

Trails

9. Evaluate the feasibility of a walking trail along Putah Creek on Yolo Bypass Wildlife Area property that could join a similar trail coming from Mace Blvd. developed by the City of Davis.

10. Continue to allow off-season, walking access to hunting areas and evaluate potential to expand this opportunity to new hunt areas.

11. Expand signage on trail network.

12. Evaluate the feasibility of connecting the Causeway Ranch with the Davis Wetlands through a trail system.

Bicycling

13. Continue to allow bicycle access to the Causeway Unit.

14. Evaluate, develop, and consider implementing a plan for allowing bicycle use on specified parts of the tour routes.

15. Continue to monitor the use of bicycles in the hunting area during hunting season.

16. Cooperate with regional trail development efforts to create bicycle access across the Yolo Bypass through the Causeway Unit at ground level.

17. Evaluate efforts to provide bicycle access to the Pacific Flyway Center and participate as infrastructure is developed and funding permits.

Wildlife Area boundary sign in winter

Signage

Compatible public uses of the Yolo Bypass Wildlife Area are facilitated by signage that informs the public of the boundaries, laws, and regulations applicable at Yolo Bypass Wildlife Area; encourages public use; reduces conflicts among uses; increases the safety of users; and discourages unauthorized uses. The tasks listed below are intended to promote the use of such signage.

18. Maintain signs and bulletin boards at the Yolo Bypass Wildlife Area Headquarters, parking lot A and any other entrances that may be developed in the future with wildlife area maps and regulations, interpretive materials, and safety information.

19. Work with California Department of Transportation (Caltrans) and Yolo County to install signage on I-80 to direct visitors to the entrance of the Yolo Bypass Wildlife Area.

20. Start a monitoring and maintenance schedule for all signage.

21. Inventory existing boundary signage and fencing, and install new signs and fencing where necessary.

22. Provide sign board in parking lot A that provides a comprehensive display of public use opportunities at the Yolo Bypass Wildlife Area. This will include a map showing currently available public use areas.

23. Provide signs marking tour routes, trails, and bicycle access areas.

24. Provide signs marking areas that are temporarily closed for nesting, maintenance, or other reasons.

25. Develop a plan for interpretive features including signs, blinds, and board walks.

26. Develop, construct, install and maintain interpretive signs.

Operations

27. Rent and maintain portable toilets.

28. Provide garbage cans.

29. Provide picnic tables in some visitor areas.

30. Provide for the opening and closing of gates to control access.

31. Improve ditch and creek crossings as needed for public use.

32. Continue to open entrance gates at sunrise (except on hunting days) and closing gates at sunset.

Other Uses

33. Evaluate the feasibility of providing canoeing or fishing opportunities at Green's Lake and Putah Creek.

34. Evaluate coordinating with the City of Davis regarding put-ins and take-outs of boats on Putah Creek.

Regional trail systems and coordination of access

35. Cooperate with the City of West Sacramento in assessing feasibility of access from the east side.

36. Cooperate with agencies promoting regional hiking, bicycle, and equestrian trail connections including Caltrans, Delta Protection Commission, Yolo County, City of Davis, and City of West Sacramento.

37. Evaluate the feasibility of establishing a regional trail along abandoned Sacramento Northern Railroad easement that traverses the Tule Ranch.

Public-Use Goal 4 (PU-4): *Continue to foster community partnerships*

DFG and the Foundation will continue to work together and coordinate as provided in the MOU. The relationship of these two organizations is an excellent example of a well-functioning public-private partnership. The benefits of the public-private partnership include the ability of each to take advantage of different funding sources to

develop and implement programs at the Yolo Bypass Wildlife Area. The tasks listed below represent a strategic approach toward fostering community partnerships.

Tasks:

1. Update the MOU between the Yolo Basin Foundation and the DFG to reflect the current operating relationship and expansion of the Wildlife Area acreage and programs.

2. Coordinate press releases and other forms of outreach.

3. Collaborate in developing new program areas.

4. Coordinate with other non-profit groups (e.g., Foundation, DU, CWA, Yolo and Sacramento Audubon Societies, Audubon California, Putah Creek Council, CVHJV) that promote wildlife-dependent education and interpretation, and recreational or hunting opportunities that can provide additional support to DFG's management of the Yolo Bypass Wildlife Area.

5. Encourage and cooperate with the long-term continuation of the Yolo Bypass Working Group.

Public-Use Goal 5 (PU-5): *Continue and expand the volunteer program.*

Volunteering is a vital element of many activities carried out by DFG and the Foundation. The volunteer program will continue to be supported and opportunities will be identified to expand programs. Volunteers assist with Discover the Flyway activities and support other educational programs in a variety of ways. Monthly public field trips are lead by volunteers. Nature Bowl, Marsh Madness, and California Duck Days rely on volunteer labor to be successful. Volunteers help maintain educational materials, photograph events, provide administrative help in the Foundation office, maintain Foundation press files, and provide help with entering information into the organization's database. Volunteers provide construction skills as needed. The Foundation provides training for volunteers involved with the Discover the Flyway program several times a year. Volunteer recognition activities include special field trips and an annual volunteer dinner. Volunteers wear nametags to identify them as volunteers. All volunteers are registered as DFG volunteers and the DFG volunteer handbook is utilized for the administration of the volunteer program. . Foundation and DFG staff maintain records of volunteer hours. Over the last decade volunteers have provided thousands of hours of labor that has been critical to the success of educational programs at the Yolo Bypass Wildlife Area. Last year volunteers provided 3500 hours of donated labor.

A group of Wildlife Area volunteers inside the Umbrella Barn

Tasks:

1. Use the existing DFG volunteer handbook and YBF volunteer materials to provide consistent direction for volunteers.

2. Expand existing volunteer materials.

3. Sign up all volunteers as DFG volunteers to take advantage of the benefits of being a volunteer for the state including workers compensation coverage and the ability to count these volunteer efforts as "in kind" contributions on grant applications.

4. Continue to coordinate with the Foundation to jointly plan use of volunteers including the development of

volunteer job descriptions.

5. Recruit new volunteers through regional media, community organizations, local colleges, professional associations, conservation organizations, and at public events.

6. Expand volunteer training opportunities.

7. Expand volunteer recognition program.

8. Continue tracking of volunteer hours for use as inkind labor contribution for state and federal grant programs.

Public Use Goal 6 (PU-6): *Minimize competition and conflicts among users and facilitate compatibility between public uses.*

Conflicts between various uses groups have potential to arise due to compatibility issues. The tasks listed below are intended to reduce conflicts among user groups.

Tasks:

1. Encourage hunter safety through monitoring and enforcement of regulations.

2. Inform the public of Wildlife Area use designations and use restrictions through outreach, signage, and DFG's web site.

3. Periodically evaluate management of access locations, tour routes, parking areas, and associated regulations to identify changes that are warranted to maintain consistency with the goals of this LMP.

4. Identify potential conflicts with other recreational uses and resolve such conflicts.

5. Inform the public of times and locations where hunting is allowed and of all other restrictions and applicable regulations through outreach, signage, and DFG's web site.

6. Have DFG and/or YBF personnel available on-site during high use times to monitor visitor activities and provide information as needed to visitors.

7. Include a DFG contact person's name, phone number, and e-mail address on signage for questions, comments, and suggestions regarding compatible uses of the Yolo Bypass Wildlife Area.

8. Conduct periodic reviews of public uses of the Yolo Bypass Wildlife Area; evaluate patterns of usage, rules, regulations, guidelines, and materials to ensure compatibility of public uses.

Modern day Native American gathering tules

Public-Use Goal 7 (PU-7): *Support use of the Yolo Bypass Wildlife Area by Native Americans for activities such as gathering native plant materials for cultural purposes.*

Gathering of limited quantities of native plant materials can be compatible with the goals of the Wildlife Area. The tasks listed below are intended to ensure that such uses are authorized only when compatible and when they take place in a manner that minimizes conflicts with other uses.

Tasks:

1. Develop access plans for and issue permits to native peoples whose activities are compatible with the goals of the LMP. Any authorization for access would include standard liability clauses.

2. Allow limited gathering of materials for educational and craft purposes by the public.

Public-Use Goal 8 (PU-8): *Facilitate safe use of the Yolo Bypass Wildlife Area by informing the public of potential risks, and also develop an emergency response plan.*

Although risks are inherent in any physical activity, informing the public of potential risks and reducing access to unsafe areas should increase the safety of users. The tasks listed below express this intent.

Tasks:

1. Continue to close the Yolo Bypass Wildlife Area when the Yolo Bypass is flooding (e.g., Fremont Weir and/or Sacramento Weir overtopping and/or west side tributaries flooding).

2. Identify areas where warning signs are needed.

3. Post warning signs at identified locations and indicate on these signs whom to contact during an emergency.

4. Coordinate with the SYMVCD regarding timing of pesticide applications.

5. Restrict access to unsafe areas such as construction zones and at times, active farming areas.

6. Develop an emergency response plan.

    a. Work with local, regional, and state agencies to integrate the Yolo Bypass Wildlife Area into emergency communications and response plans.

    b. Work with Yolo County and local fire districts to improve coordination of emergency services.

5.2.5 UNAUTHORIZED-PUBLIC-USE ELEMENT

Disposal of waste, construction of unauthorized structures, camping, use of generators and fires, and other illegal activities have the potential to occur in the Yolo Bypass Wildlife Area. These unauthorized uses damage the Yolo Bypass Wildlife Area's ecosystems, affect special-status and game species and their habitats, and interfere with authorized uses. The limited availability of staff and funding substantially constrains management of unauthorized uses.

Unauthorized-Public-Use Goal 1 (UPU-1): *Prevent unauthorized use of the Yolo Bypass Wildlife Area.*

Preventing unauthorized uses would prevent the adverse effects caused by those uses. The tasks listed below are intended to reduce the frequency and effects of unauthorized uses.

Tasks:

1. Prohibit activities that are inconsistent with the Yolo Bypass Wildlife Area mission in the Wildlife Area regulations.

2. Require CEQA analysis and surface agreements for access to the area for mineral extraction.

3. Discourage dumping of trash or waste within the Yolo Bypass Wildlife Area by providing and servicing trash receptacle.

4. Patrol the Yolo Bypass Wildlife Area and enforce regulations that prohibit unauthorized uses.

5. Maintain adequate signage on boundaries to satisfy lawful enforcement of Wildlife Area regulations.

6. Use signage and written notifications to foster cooperation.

7. Issue citations and/or pursue legal action when voluntary cooperation cannot be obtained.

8. Enforce laws through DFG Wildlife Protection personnel and request assistance from the Yolo County Sheriff's Department as necessary to enforce laws.

9. Issue citations to violators illegally using the Yolo Bypass Wildlife Area and seek remediation from unauthorized users.

10. Restore ecosystems damaged by unauthorized uses as necessary.

5.2.6 FACILITIES ELEMENT

Platform of elevated pump station

Facilities at the Yolo Bypass Wildlife Area include the public access roads, hunting blinds, check stations, water management–related infrastructure, and other facilities listed below. Sacramento River Flood Control Project levees on the east and west boundaries of the Wildlife Area are maintained by the DWR and Reclamation Districts. These facilities support flood protection.

There are also a number of important constraints on construction and maintenance of facilities at the Yolo Bypass Wildlife Area. These constraints include:

- limited availability of staff and funding;
- flooding of the Yolo Bypass limits access for construction and maintenance of facilities in the Bypass;
- flooding has the potential to cause damage to roads, crossings, water distribution system, and pumps;
- the DWR and State Reclamation Board easement for flood flow conveyance; and
- potential effects on conveyance of flood waters.

Chapter 2, "Property Description," contains additional information regarding facilities at the Yolo Bypass Wildlife Area.

Winter flooding in 2006

Facilities Goal 1 (F-1): *Management and operation of the Yolo Bypass Wildlife Area in coordination with state and federal flood operations in the Yolo Bypass.*

Facilities throughout the Yolo Bypass Wildlife Area require construction, maintenance, and removal in response to initiation of flood flow conveyance in the Yolo Bypass. The tasks listed below are intended to address facilities construction, maintenance, and removal needs. A discussion on the Sacramento River Flood Control Project, the State-Federal Flood Operations Center, and operation of Fremont Weir and Sacramento Weir is provided in section 3.1, "Planning Influences and Considerations."

Tasks:

1. Upon notification call by DWR Division of Flood Management, implement and follow the following flood response protocol:

    a. Remove hunter check station, portable restrooms, and other movable structures as necessary.

    b. Close gates at Wildlife Area access points.

    c. The most critical areas are those structures which adjoin the Toe Drain/canals. When water in these areas reaches the level of the water in the ponds, remove all check boards.

    d. Pull all the boards in irrigated agricultural fields (or as many as can be safely reached). Screw gates should also be opened. This may increase sedimentation in the pipes but it will also help to decrease the potential for the flash boards floating away and being lost.

    e. Pull boards in internal structures to allow water in the cells to equalize prior to flooding to reduce erosion effects.

    f. If internal structures are not pulled prior to a flood event, then the progression typically is from east to west; pull external boards, open screw gates, and then follow the water as it moves to the west.

    g. Close and cap alfalfa valves to prevent sedimentation.

    h. Close pipeline in the Causeway Ranch Unit to prevent sedimentation in the pipe. Mark screw gate and alfalfa valve locations in order to relocate when floodwater recedes.

    i. Open screw gate structure at central lift station and pull boards on the structure immediately west of the station.

    j. Leave control box heaters on at pump stations as this will help dry out any moisture that may occur.

    k. Decision needs to be made regarding pulling central lift pumps and west pump– generally the pumps should be pulled in severe events.

    l. After the waters recede:

        1. Clean out bowls at the submersible pump stations.

2. Dry pump motors that may have received moisture during the flood event before putting back in operation.

Cleaning out mud from pump station sump

Facilities Goal 2 (F-2): *Construction, maintenance, and removal of facilities.*

Facilities throughout the YWBA require construction, maintenance, and removal for various purposes. The tasks listed below are intended to address facilities construction, maintenance, and removal needs.

Tasks:

1. Maintenance of hunting blinds and the hunter check station performed by DFG.

2. Maintenance of water management infrastructure including pumps, water control gates, and water distribution system performed by DFG, agricultural lease tenants, and cooperatively by members of the Mace Ranch Irrigation System.

3. Maintenance of gravel roads on an ongoing basis.

4. Construction and maintenance of new access roads.

5. Maintenance of gates and fences.

6. Construction of new gates and fences.

7. Maintenance of signs.

8. Maintenance for other facilities:

    a. Yolo Bypass Wildlife Area Headquarters 13-acre site with office building, residence, equipment, landscaping, parking lot,, fences, gravel road, and shop buildings and related facilities, fish screen shop, various portable buildings including one used by DFG wardens as base station, and portable office unit owned by YBF;

    b. Yolo Demonstration Wetlands located at the Yolo Bypass Wildlife Area Headquarters;

    c. Kiosk at Yolo Fruit Market operated jointly with the Foundation;

    d. House on Pacific Flyway Center site;

    e. Tule Ranch Headquarters compound; and

    f. Tule Ranch Umbrella barn.

9. Work with the Foundation to develop interpretive signs and other features such as kiosks, shade structures, blinds, and boardwalks to enhance the value for visitors.

Facilities Goal 3 (F-3): *Effectively manage existing facilities and/or structures for resource protection, safety, and prevention of unauthorized uses.*

Management of facilities/structures for resource protection, safety, and prevention of unauthorized uses will contribute to the attainment of goals for biological and public use elements. The tasks listed below are intended to facilitate effective management of Yolo Bypass Wildlife Area facilities.

Tasks:

1. Regularly monitor the condition and use of existing facilities/structures.

2. Take actions as needed to keep desired facilities/structures in good repair.

3. Schedule preventative maintenance of all facilities and structures.

4. Take actions to demolish and remove those structures that are unauthorized or have become unsafe or undesirable.

Facilities Goal 4 (F-4): *Construct, operate and maintain the Pacific Flyway Center and other associated facilities.*

Tasks:

1. Construction of the Pacific Flyway Center is a goal of DFG. The continuing efforts to establish the center will be supported.

2. Participate in program development phase, schematic design phase, and construction phase in partnership with the Foundation.

3. Determine what needs to be accomplished to change location of entrance to the Wildlife Area if needed.

4. Move administrative and interpretive functions to the Pacific Flyway Center.

5. Operate and maintain the Pacific Flyway Center.

6. Manage the approximately 15 acres of farm land on the Flyway Center site to be a demonstration of wildlife friendly farming.

7. Work with the Foundation to fund, construct, update and maintain exhibits and other interpretive features of the Pacific Flyway Center.

8. Maintain gates and access road to Flyway Center.

Facilities Goal 5 (F-5): *Maintain equipment necessary for future management of the Wildlife Area.*

Habitat management activities require the use of a staggering variety of equipment, tools, and vehicles. Each of these elements must be maintained, repaired and replaced as necessary. These items range from large farm tractors and implements to commercial vehicles, welders, generators, wood working tools, incinerators, boats, all terrain vehicles, compressors, and hand tools.

Tasks

1. Repair and maintenance of heavy equipment including various tractors and implements.

2. Maintenance and operation of commercial vehicles.

a. Maintain current compliance with Department of California Highway Patrol Biennial Inspection of Terminals (BIT) Program.

b. Maintain commercial vehicles through regular BIT inspections.

c. Tractor Operator Laborer to maintain current commercial driver's license.

d. Provide commercial vehicle driving services to other Department of Fish and Game facilities as necessary.

3. Maintenance and operation of wheeled vehicles other than commercial vehicles.

4. Maintenance and operation of shop facility.

5. Maintenance and operation of miscellaneous tools and equipment.

6. Maintain office equipment including computers, printers, copy machine, plotter, telephone system.

Facilities Goal 6 (F-6): *Consider the construction and operation of an outdoor shooting range for bi-annual use by local game warden squad for periodic firearm use qualification process.*

Range construction, operation and maintenance shall consider the following tasks:

Tasks

1. Implementation of Environmental Protection Agency (EPA) best management practices for the management of lead at outdoor shooting facilities.

2. Operation of the shooting range will not proceed until after development of a shooting range use protocol in accordance with National Rifle Association (NRA) standards as detailed in the NRA Range Source Book. This protocol shall designate a point of contact within DFG's Wildlife Protection Branch and a Range Master shall be designated for each instance of use. This operations plan and subsequent use is to be approved by the Yolo Bypass Wildlife Area Manager.

3. Construction of the shooting range shall conform to standards and guidelines established by the Occupational Safety and Health Administration, the National Association of Shooting Ranges (NASR) and the Sporting Arms and Ammunition Manufacturers' Institute (SAAMI), with the intention of controlling hazards and prevention of exposures to hazardous substances in shooting range facilities.

4. Maintenance of the shooting range shall be the responsibility of the Wildlife Protection Branch.

5.2.7 ADMINISTRATION ELEMENT

Administration of the Yolo Bypass Wildlife Area includes maintaining and providing records of management actions and expenditures, allocation of staff time, procurement of needed supplies and equipment, solicitation of grant monies to supplement operating income, habitat management activities, and agriculture management activities and/or leases.

Administration Goal 1 (A-1): *Maintain current data on the management and resources of the Yolo Bypass Wildlife Area.*

Current data on the management and resources of the Yolo Bypass Wildlife Area will support attainment of goals for biological, cultural, public use, and facility elements. The tasks listed below are intended to promote maintenance of needed data.

Tasks:

1. Regularly update geographic information system (GIS) data sources as information becomes available.

2. Maintain accurate financial records regarding expenditures, staff, maintenance, and other administrative duties.

3. Facilitate the planning and paying of Wildlife Area expenses.

4. Administer agricultural leases as necessary in cooperation with staff from the Dixon Resource Conservation District (RCD).

    a. Annually plan agricultural activities throughout the Wildlife Area including production fields and wildlife food plots.

    b. Coordinate desires of lessees with limitations of Mace Ranch Irrigation System and its other users.

    c. Plan for administration of Farm Service Agency funds to lessees and reciprocal services to be provided to Wildlife Area.

    d. Periodically inspect agricultural activities throughout the year.

    e. Plan for the post harvest treatment of agricultural fields.

5. Document facilities needs in a DFG maintenance and capital outlay database.

6. Prepare annual and periodic status reports as defined in the future Chapter 6, "Operations and Maintenance."

7. Perform scheduling function for conference room.

8. Participate in habitat planning efforts for areas close to the Wildlife Area.

9. Supervise permanent and seasonal staff.

10. Actively pursue funding to help facilitate implementation of the LMP.

5.2.8 FIRE MANAGEMENT ELEMENT

Burning of emergent vegetation in a permanent pond

Fires within the Yolo Bypass Wildlife Area are rare, but there is the potential for natural (e.g., lightning) or human-caused fires to be started. Additionally, at the Yolo Bypass Wildlife Area, there are opportunities to employ fire as a habitat manipulation tool. Fires at the Yolo Bypass Wildlife Area may have both adverse and beneficial effects on the attainment of the goals of this LMP. For example, fires can have benefits to native vegetation and may contribute to attainment of the goals for the biological element. Conversely, fires also may damage facilities, injure staff and visitors, and thus may interfere with the attainment of goals for public use and facilities.

The Yolo Bypass Wildlife Area lies within two special fire districts. Land north of Putah Creek is part of the East

Davis Fire District and lands to the south of Putah Creek are in the No Man's Land Fire District. Each of these fire districts collects assessments from property owners within their districts and contracts with the City of Davis for emergency services. Per the terms of Proposition 218, it is the policy of the DFG to not pay assessments to special districts unless DFG is receiving "special services." Proposition 218 specifically states that fire and ambulance services are not considered "special services" and therefore, the DFG pays no assessments to either the No Man's Land or East Davis Fire Districts. Nevertheless, the DFG would consider it mutually beneficial to cooperate with these fire districts in the event of an emergency.

There are a number of constraints on fire management at the Yolo Bypass Wildlife Area. These constraints include:

- Availability of staff and funding;
- potential adverse effects on air quality,
    - the geographic position of the Wildlife Area is such that prevailing Delta breezes tend to move fire smoke into the Sacramento metropolitan area;
- public safety;
- facilities; and
- public use.

Fire Management Goal 1 (FM-1): *Develop and implement a wildfire plan for the Yolo Bypass Wildlife Area.*

In 1994, the California State Board of Forestry and the California Fish and Game Commission adopted a *Joint Policy on Pre, During, and Post-fire Activities and Wildlife Habitat* (California State Board of Forestry and California Fish and Game Commission 1994). This joint policy describes multiple measures that both the California Department of Forestry and Fire Protection (CDF) and DFG should undertake to protect lives and property with consideration of natural resources. These measures would be implemented before, during, and after fires. The tasks listed below are intended to facilitate implementation of fire protection measures.

Tasks:

1. Meet biannually if necessary with CDF representatives to discuss fire-related issues relevant to the Yolo Bypass Wildlife Area, including vegetation management, recent fires in the Yolo Bypass Wildlife Area, current contact information, and procedures.

2. Coordinate with CDF to develop a wildland fire response plan for the Yolo Bypass Wildlife Area. This plan would give protection of life and property the highest priority during fire response, but would also give careful consideration to effects on the natural resources of the Yolo Bypass Wildlife Area. This plan should identify fire suppression tactics that could have long-term effects on ecosystems (e.g., use of retardant). Those tactics should be avoided or modified whenever feasible to avoid or minimize long-term effects on the ecosystems of the Yolo Bypass Wildlife Area. The plan should also identify critical areas where emergency revegetation or mechanical or structural measures may be contemplated to prevent excessive erosion or flooding after a fire. The potential effect of such practices on special status plants should be considered.

3. Design and implement vegetation management activities at fire breaks along existing roads and parking lots.

4. Train a DFG biologist to serve the role of resource specialist or agency representative through the Incident Command System (ICS).

a. As part of the ICS, make available a local plant, wildlife, and fisheries specialist from DFG's staff to provide advice during fires and for post fire rehabilitation that threaten wildlife habitat at the Yolo Bypass Wildlife Area.

5. Following a fire or fire suppression, implement emergency revegetation, mechanical, and structural measures within those previously defined critical areas that were affected.

6. Coordinate fire suppression activities and cooperate with local fire districts.

5.2.9 SCIENTIFIC RESEARCH AND MONITORING ELEMENT

Scientific research and monitoring contributes to sound management of wetlands, agricultural areas, riparian areas, grasslands and uplands, and aquatic ecosystems both in and beyond the Yolo Bypass Wildlife Area. It is also a key component of successful adaptive management programs. Monitoring results of management actions is the key feed back feature of an adaptive management approach to land management. There are unlimited possibilities within innumerable disciplines to conduct research that may affect management decisions. However, current and/or recent studies on fisheries resources, hydraulic analysis, resource assessments, mosquito abatement, and water quality conducted at or near the Yolo Bypass Wildlife Area have especially relevant ramifications. The status of these "big five" topics are summarized below:

FISHERIES

Previously described research regarding use of the Yolo Bypass by native fish during seasonal flooding events has sparked significant interest in managing this floodplain of the Sacramento River for these species. Additional research should be conducted to adequately describe the use of the Bypass by Chinook salmon, Sacramento splittail, and white and green sturgeon. Management options should be investigated with complete respect for ongoing wetland habitat projects already established with the broad support of Bypass stakeholders and land owners.

HYDRAULIC ANALYSIS

With the development of the RMA 2 model by the USACE, a tool now exists to more accurately predict the hydraulic effects of proposed land management actions. Continued application of this model to planned restoration efforts will further improve the long-term management of land use in the Yolo Bypass.

RESOURCE ASSESSMENT

DFG is preparing a field-verified vegetation map of the Yolo Bypass Wildlife Area. However, detailed inventory data are lacking for portions of the Yolo Bypass Wildlife Area. For example, plant species lists based on field surveys do not exist for the entire Yolo Bypass Wildlife Area (e.g., areas within the Tule Ranch Unit). Although the species list for the Yolo Bypass Wildlife Area (see Appendix G) is field-based and comprehensive for all species on-site, field verification is needed to determine the presence of several expected amphibian, reptile, and mammal species. There is also no formal ongoing monitoring of invasive plant populations, special-status plant populations or their habitats, wildlife responses to Yolo Bypass Wildlife Area's innovative management of agriculture, or any monitoring that could be used to evaluate the effects of public use on ecosystems at Yolo Bypass Wildlife Area.

MOSQUITO ABATEMENT

With the arrival of West Nile Virus, it is imperative that the operation of the Yolo Bypass Wildlife Area is conducted in a manner that is not dangerous to the local community which it serves. Research into the effects of ground disturbance upon the production of mosquito larvae has been promising, with broad ramifications for wetland managers with potential mosquito production conflicts. Continued research regarding the fine tuning of established "Best Management Practices" for wetlands will further the collaborative relationship the Yolo Bypass Wildlife Area shares with the Sacramento Yolo Mosquito and Vector Control District.

Mercury

Although much is uncertain in regards to the role wetlands play in the methylation of mercury, certain wetland characteristics appear to minimize this concern. Projects should be designed to minimize the potential for mercury methylation as much as possible. Appropriate project features include open-water swales, active drainage and water movement to promote aerobic (i.e., oxygen rich) conditions, and tailwater detention basins for post-flood demethylation. Extensive research is being conducted to help understand the finer nuances of methylation processes in wetlands.

The Central Valley RWQCB is currently in the process of developing a mercury and methylmercury TMDL for the Delta. Characterization of existing conditions and potential development of BMPs are two potential requirements of the TMDL. Development and implementation of experimental BMPs to address mercury methylation holds great potential to better understand and address wetland restoration throughout the region.

Thus, additional research and monitoring could benefit management and attainment of goals for biological and public use elements.

Many opportunities exist at the Yolo Bypass Wildlife Area for scientific research and monitoring. These include:

- basic resource assessment to document what currently exists on the Yolo Bypass Wildlife Area; and
- monitoring of all of the following:
    - wildlife and natural community responses to the management of wetlands, agricultural areas, riparian areas, uplands and grasslands, and aquatic ecosystems;
    - floodplain processes (e.g., hydrology, geomorphology, fisheries resources, and primary production); and
    - mercury methylation processes in managed wetlands and agriculture;
- development and monitoring of experimental BMPs to reduce/minimize mercury methylation processes;
- monitoring of mosquito control BMPs;
- management of public use activities in a natural setting;
- implementation of agricultural techniques that provide wildlife habitat benefits;
- importance of agricultural buffer areas to wildlife habitat management areas;

- compilation of existing background information by this and other reports;
- coordination with other branches of DFG that are conducting data collection and mapping activities;
- coordination with other resource agency departments including DWR, California Department of Conservation, and California Department of Food and Agriculture on monitoring, mapping, and other types of data collection;
- coordination with federal agencies such as NOAA, NMFS, USGS, USFWS, USACE on data collection and mapping;
- coordination with private organizations such as California Waterfowl Association, Ducks Unlimited, CA Audubon, and Point Reyes Bird Observatory on data collection;

Proximity of the Yolo Bypass Wildlife Area to universities, colleges, and other academic institutions presents opportunities to:

- actively promote the Wildlife Area to local academic institutions as a resource available for research activities; and
- establish long term working relationships with local academic institutions.

There are also a number of important constraints on scientific research and monitoring of the Yolo Bypass Wildlife Area. These constraints include:

- limited availability of staff and funding;
- public use of much of the Wildlife Area; and
- seasonal flooding.

Scientific Research and Monitoring Goal 1 (SRM-1): *Support appropriate scientific research and monitoring and encourage or conduct research that contributes to adaptive management strategies and management goals of the Yolo Bypass Wildlife Area.*

This goal is based on the need for data from monitoring and scientific research to attain many of the goals of this LMP, and on the policies of the California Fish and Game Commission. It is the policy of the California Fish and Game Commission that research shall be performed to provide scientific and management data necessary to promote the protection, propagation, conservation, management, or administration of fish and wildlife resources; whenever possible and advantageous, the services of the University of California, California State University, or other academic or research institutions, or federal, state, or local agencies shall be used. The tasks listed below are intended to promote continuance of appropriate scientific research related to the Yolo Bypass Wildlife Area.

Tasks:

1. Prepare an annual Wildlife Area Habitat Management Work Plan Summaries and submit summaries to the DFG Wildlife Area Habitat Committee (WAHC), and DFG headquarters staff for evaluation.

    a. Implement recommendations for habitat improvement provided by the WAHC.

2. Develop a prioritized list of research needs.

3. Review and evaluate proposed research projects using the following criteria:

a. Potential for research results to improve management of the Yolo Bypass Wildlife Area, other wildlife areas, or other ecosystems;

b. Potential for conflicts between the research and compatible public uses;

c. Potential for conflicts between the research and any biological goals stated in this LMP; and

d. Scientific rigor in the proposed research design, methods of study, and scope of inference.

4. Provide letters or permits to researchers specifying dates and times of authorized access, and information on regulations and area restrictions.

5. Require that researchers provide copies of data and/or published papers, and contact researchers to ensure that this requirement is fulfilled.

6. Encourage long-term studies of the following:

a. Ecology of managed wetlands;

b. Agroecology;

c. Wildlife friendly agricultural practices;

d. Vernal pool ecology and management;

e. Native grassland ecology and management, including management of grazing to enhance native species diversity;

f. Invasive species management;

g. Trends in abundance of migrant and/or wintering waterfowl and shorebirds, in support of regional population monitoring throughout the Pacific Flyway;

h. Trends in abundance, reproduction, survival, and/or habitat use by special-status species (e.g., giant garter snake), game species, or other species of regional interest (e.g., grasshopper sparrow);

i. Mercury methylation processes in managed wetlands and crops, development and monitoring of experimental demethylation BMPs, and effects of methyl mercury on birds and other wildlife; As part of the LMP planning process a focus group meeting was held to discuss mercury / methylmercury research needs and opportunities (see Appendix A). Several needs and opportunities were identified. Follow-up meetings should be convened to continue these discussions.

7. Conduct high-priority surveys, including surveys for special-status species, as time and budget permit;

8. Investigate public use patterns and effectiveness of public use programs;

9. Investigate effectiveness of environmental education programs; and

10. Encourage sharing of scientific information through the Yolo Bypass Working Group.

5.2.10 MANAGEMENT COORDINATION ELEMENT

The creation and expansion of the Yolo Bypass Wildlife Area involved significant and complex coordination and partnership building with many agencies and organizations. The management of the Yolo Bypass Wildlife Area has continued in a spirit of cooperation and coordination. The result is a successful public private partnership with the DFG managing the Wildlife Area and the Yolo Basin Foundation managing many of the public use programs. The Wildlife Area is a successful model of cooperation between many agencies and organizations and the same approach should continue through the life of this LMP.

There are opportunities for continued management coordination at the Yolo Bypass Wildlife Area including:

- ongoing flood management activities with DWR, the State Reclamation Board, USACE, and the Sacramento Area Flood Control Agency (SAFCA);
- coordination of land use activities in the Yolo Bypass with the Yolo Bypass Working Group;
- coordination with the development and execution of the Yolo County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP);
- ongoing wetland management activities coordinated with mosquito abatement by SYMVCD;
- law enforcement by the Yolo County Sheriff's Department;
- land use planning by Yolo County and cities of West Sacramento and Davis including General Plans and open space planning;
- water supply planning by Yolo County Water Resource Association through the Integrated Regional Water Management Plan;
- fisheries and flow on Putah Creek with the Lower Putah Creek Coordinating Committee;
- ongoing regional recreational planning by local agencies (e.g., Yolo County, Sacramento County, the City of West Sacramento, the City of Davis);
- regional invasive-plant control efforts by the California Department of Food and Agriculture and Yolo County Agricultural Commissioner's Office;
- fire-management planning by CDF and local fire districts;
- activities of the DWR-Broddrick Maintenance Yard for levee maintenance;
- State Reclamation Board 2-dimensional Hydraulic Model;
- water supply and drainage with RD 2068;
- mercury monitoring and research with CVRWQCB, USGS, UC Davis, and others;
- hazardous waste storage and disposal program administered by Yolo County;
- Yolo County emergency response planning;

- activities of California Bay-Delta Authority programs, particularly the CALFED ERP; and
- regional (i.e., Yolo Bypass) ecosystem restoration planning including DWR/Aquatic Restoration Project Implementation.

Management Coordination Goal 1 (MC-1): *Coordinate with federal, state, and local agencies regarding plans and projects that may affect habitats and/or management at the Yolo Bypass Wildlife Area.*

It is the policy of the California Fish and Game Commission that to provide maximum protection of fish and wildlife and their habitats. DFG shall review and comment on proposed flood management, ecosystem restoration, and water development projects or other projects affecting habitat in the Yolo Bypass Wildlife Area, and shall recommend and seek the adoption of proposals necessary or appropriate for the protection and enhancement of fish and wildlife and their habitat. The tasks listed below are intended to foster improved interagency coordination on issues pertinent to management of the Yolo Bypass Wildlife Area.

Tasks:

1. Review, coordinate, and provide comments and recommendations on federal, state, and local government plans and proposed projects as appropriate for the purpose of determining the consistency of such plans with the goals of DFG's LMP.

2. Coordinate with Yolo County NCCP proponents to make them aware of habitat restoration efforts at the Wildlife Area and coordinate proposed actions to compliment each other's efforts such as insuring the long-term presence of agricultural lands between the Davis city limits and the Yolo Bypass south of I-80.

3. Coordinate with the Yolo County program to survey, control, and monitor invasive plant species.

4. Collaborate with or submit proposals for CALFED-funded projects that could contribute both to the attainment of the goals of this LMP and to the attainment of CALFED goals, objectives, targets, and milestones.

5. Support the implementation of research, monitoring, and restoration actions compatible with the goals of this LMP by the California Bay-Delta Authority and other CALFED implementing agencies.

Management Coordination Goal 2 (MC-2): *Coordinate with flood control agencies regarding flood control and management in the Yolo Bypass.*

The primary function of the Yolo Bypass is flood control and management. DFG shall continue to coordinate with flood control agencies (i.e., DWR, the State Reclamation Board, and USACE) regarding all potential restoration projects and other activities that could affect flood flow conveyance in the Yolo Bypass. DFG will also review and comment on proposed flood management and water development projects or other projects that could affect habitat and/or management in the Yolo Bypass Wildlife Area. As necessary, DFG will also reconsider appropriate elements in the LMP if new flood control alternatives are developed in the future. This would be part of the overall adaptive management process for implementing the LMP. The tasks listed below are intended to foster coordination with flood control agencies regarding management of the Yolo Bypass.

Tasks:

1. Review, coordinate, and provide comments and recommendations on plans and proposed projects as appropriate to determine the consistency of such plans with the goals of DFG's LMP. DFG biologists in the Sacramento Valley Central Sierra Region shall serve as the lead in coordinating ecosystem restoration components of future flood protection improvement efforts.

2. Coordinate with DWR, the State Reclamation Board, USACE and, where appropriate, local flood control agencies, reclamation districts, and SAFCA regarding the design and operation of restoration and enhancement projects that have the potential to conflict with necessary flood flow conveyance requirements. All projects should continue to be designed and operated to continue to have no impact on existing flood flow conveyance requirements of the Yolo Bypass. Additionally, design and operation of habitat restoration and enhancement projects shall consider affects on the Yolo Bypass design flow as well as its current capacity and on the ability to maintain the project at reasonable costs in conformance with USACE operation and maintenance manuals. Project planning may include necessary hydraulic modeling to guide design and confirm achievement of performance criteria (i.e., avoid potential adverse effects on necessary flow conveyance). All hydraulic modeling should be conducted in coordination with appropriate flood control and management agencies. A work plan for hydraulic modeling is provided in Appendix C.

3. Participate in ecosystem restoration components of any overall improvements to the Lower Sacramento Flood Control System.

4. Continue public outreach programs that describe the compatible nature of appropriate wetland management activities with flood protection efforts.

Management Coordination Goal 3 (MC-3): *Coordinate with other law enforcement agencies.*

The jurisdictions of multiple law enforcement organizations overlap at the Yolo Bypass Wildlife Area, and thus coordination among them should lead to more effective law enforcement; this should also support attainment of the goals of this LMP for public-use elements. The tasks listed below are intended to foster coordination with the appropriate law enforcement agencies.

Tasks:

1. Meet on an annual basis with local Wildlife Protection squad prior to waterfowl hunting season to review Wildlife Area regulations, work schedules, exchange contact information and intricacies of public hunting program.

2. Continue ongoing communication with Wildlife Protection staff throughout the year.

3. Meet regularly with law enforcement staff from the California Highway Patrol and Yolo County Sheriff's Department and other agencies as appropriate to coordinate law enforcement activities and explore options for cooperative programs.

4. Pursue joint funding requests with other law enforcement entities to address law enforcement concerns.

Management Coordination Goal 4 (MC-4): *Coordinate with local public-service agencies including the SYMVCD and the Yolo County Health Department.*

Section 1507 of the California Fish and Game Code contains language regarding the control of mosquito production of managed wetlands in DFG's wildlife areas. Control of mosquito production in wetlands and agricultural fields (e.g., rice fields) shall be a priority for DFG. As described in Section 1507, mosquito production should be controlled in a manner that:

- maintains or enhances habitat values for waterfowl and other wildlife;
- minimizes financial costs to DFG and SYMVCD;
- reduces the need for chemical treatment or other nonecological mosquito control; and

- increases coordination and communication between DFG and SYMVCD, and the California Department of Health Services.

The tasks listed below are intended to foster coordination of mosquito and vector control activities.

Tasks:

1. In consultation with SYMVCD, continue to implement a mosquito control plan that applies BMPs and any other necessary management practices as identified in the *Central Valley Habitat Joint Venture, Technical Guide to Best Management Practices for Mosquito Control in Managed Wetlands* (Kwasny et al. 2004) and the California Rice Commission's BMPs for mosquito control.

2. Communicate regularly with SYMVCD. Coordinate mosquito and vector control activities. Meet annually with mosquito abatement agencies to discuss needed infrastructure improvements, identify areas of high mosquito productivity, schedules of summer irrigations and fall flood up, and scheduling of public use activities.

3. Conduct annual meeting with private wetland managers in the Yolo Bypass and SYMVCD staff to coordinate fall flood up of wetlands, target habitat infrastructure improvements and firm up contact information.

4. Coordinate with Yolo County Health Department as necessary.

5. Apply for grants and matching funds with SYMVCD to implement BMPs.

6. Jointly conduct research to measure land management effects on mosquito production.

Management Coordination Goal 5 (MC-5): *Maintain relationships with neighbors and tenants to address management issues.*

Activities of neighbors, agricultural and duck club interests, and tenants in the Yolo Bypass Wildlife Area all affect ecosystems and public uses at the Yolo Bypass Wildlife Area. Maintaining relationships with neighbors and tenants can thus contribute to attainment of most goals of this LMP. This can best be done through continued involvement and leadership within the Yolo Bypass Working Group, as well as through personal communication over the phone and in person.

The tasks listed below are intended to foster improved relationships between DFG and Yolo Bypass Wildlife Area neighbors and tenants.

Tasks:

1. Meet or correspond with adjacent landowners and tenants as needed individually or through the Yolo Bypass Working Group to maintain communication about management needs of the Yolo Bypass Wildlife Area, determine adjacent landowners' access and management needs, and convey useful information regarding activities.

2. Collaborate with adjacent landowners and tenants regarding DFG management activities that may affect their operations. Resolve potential issues by proactively working with adjacent landowners and tenants.

3. Collaborate with adjacent special districts including Reclamation District 2068, Dixon RCD, Yolo RCD, No Man's Land Fire District, East Davis Fire District, South Davis Drainage District, and other neighboring special districts.

4. Area Manager and appropriate staff should attend annual site visits to duck hunting clubs conducted by DFG headquarters staff as part of the implementation of various wetland easement programs.

5. Meet at least annually with duck club owners and SYMVCD to discuss fall flood-up schedule and summer irrigations.

6. Meet annually with SYMVCD to target field work in areas that have a high propensity to produce large numbers of mosquitoes to prevent abatement issues later during flood up.

7. Coordinate flooding of duck clubs through the Tule Ranch Irrigation System.

    a. Review, modify, and exercise agreements with adjacent duck hunting clubs regarding the delivery of water and use of Wildlife Area roads as necessary.

    b. Review billing process.

    c. Collect fees on an annual basis for water delivery and road use.

Management Coordination Goal 6 (MC-6): *Coordinate activities associated with managing cholera, avian flu, and other disease outbreaks.*

Continued preparedness training is necessary as increasing numbers of wildlife diseases appear in North America. The Department of Fish and Game will have the lead on surveillance of wild bird populations for the presence of avian influenza. Additionally, regular visual monitoring of birds for the presence of avian botulism and avian cholera will continue.

Tasks:

1. Conduct regular visual monitoring of birds for the presence of botulism in the summer and avian cholera in the winter.
    a. Submit carcass samples to Wildlife Investigations Laboratory for evaluation.
    b. Conduct clean up operations as necessary in order to remove carcasses.
    c. Incinerate carcasses as they arrive.
    d. Improve circulation of water or other management activities to prevent spread of the disease.

2. Conduct regular monitoring of harvested birds at the hunter check station for the presence of avian flu.

3. Participate in disease related work groups.

4. Coordinate with county and state public health agencies, and UC Davis.

5. Participate in Incident Command System (ICS) activities.